

Figure 1a

	MS-GPC-8-27-7	MS-GPC-8-27-10	MS-GPC-8-6-13	MS-GPC-8-27-41	MS-GPC-8-6-47	MS-GPC-8-10-57	MS-GPC-8-6-27	MS-GPC-8	MS-GPC-8-6
Plastic	-0.004	-0.020	-0.022	-0.025	-0.001	0.005	0.007	-0.022	-0.018
BSA	-0.003	-0.019	-0.021	-0.022	0.008	0.003	0.003	-0.016	-0.019
Testosterone-BSA	-0.005	-0.010	-0.012	-0.007	0.011	0.003	0.002	-0.009	-0.012
Lysozyme	-0.005	-0.079	-0.079	-0.073	0.013	0.014	0.006	-0.081	-0.072
human Apotransferrin	-0.009	-0.016	-0.018	-0.018	-0.005	-0.008	-0.004	-0.014	-0.016
MHCII (DRA*0101/ DRB1*0401)	1.549	1.493	1.467	1.525	1.400	1.256	1.297	1.058	1.306

Figure 1c

Target Proteins	scFv						IgG
	17	2E	45	5C	73	8A	
DR4Dw4 Purified	+	+	+	+	+	+	+
Chimeric DR-IE purified	+	+	+	+	+	+	+
Lysozyme	-	-	-	-	-	-	-
Transferrin	-	-	-	-	-	-	-
BSA	-	-	-	-	-	-	-
Human gamma globulin	-	-	-	-	-	-	-

a. In Elisa, OD (at 370 nm - background): > 1.5

b. In Elisa, OD (at 370 nm - background): < 0.5

Figure 1b

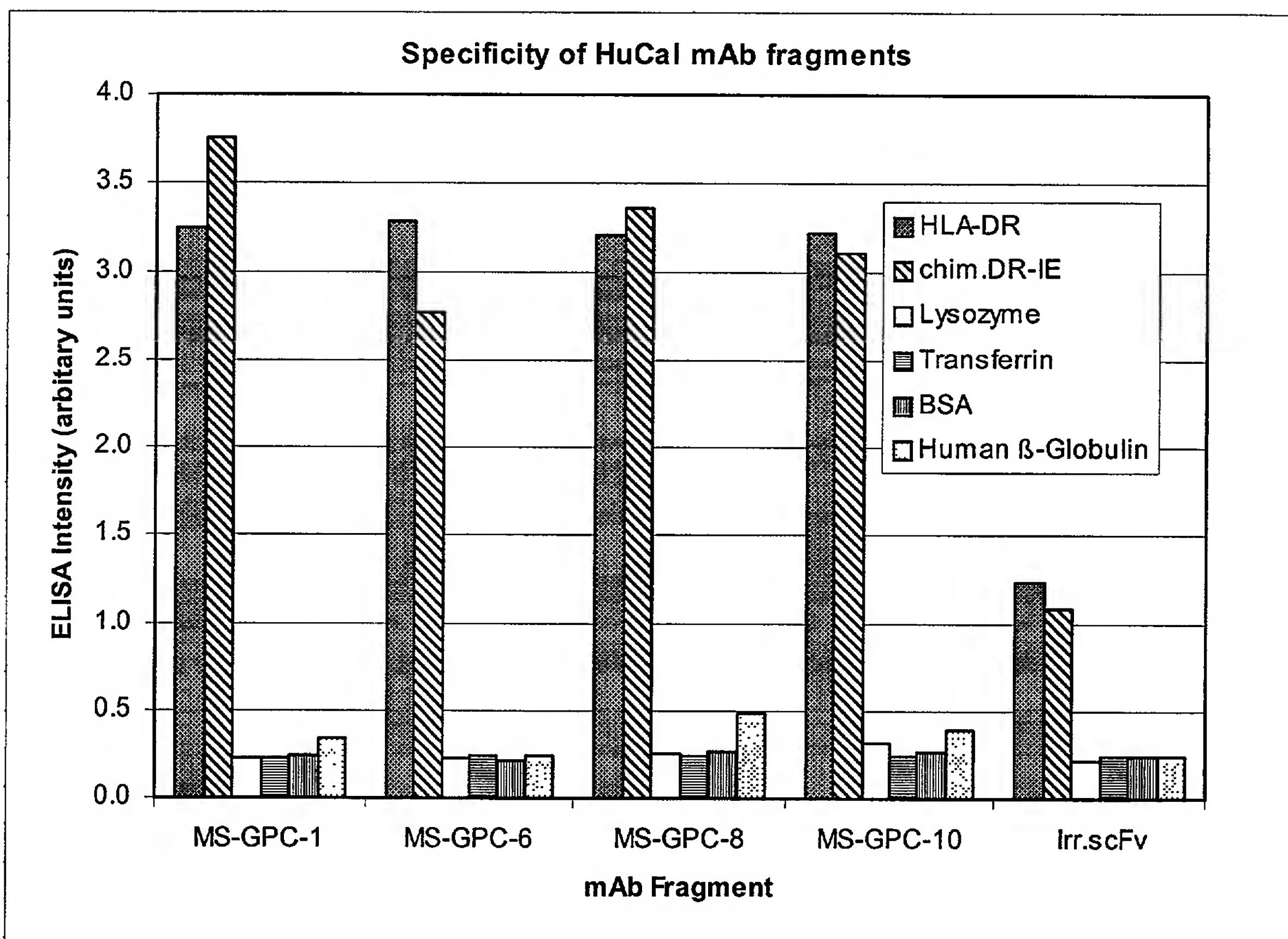


Figure 2

Cell Line	HLA-	DRB1*	scFv									IgG		
			17	2E	45	5C	73	8A	A1	B8	E6	FD	159	170
LG2	DR1	0101	+ ^a	+	- ^b	-	+	+	+	+	+	+	+	+
E4181324	DR2	15021	+	+	-	-	+	+	+	+	+	+	+	+
VAVY	DR3	0301	+	+	-	-	+	+	+	+	+	+	+	+
PRIESS	DR4Dw4	0401	+	+	+	+	+	+	+	+	+	+	+	+/- ^c
TS10	DR4Dw10	0402	+	+	-	+/-	+	+	+	+	+	+	+	+
BIN40	DR4Dw14	0404	+	+	+/-	+/-	+	+	+	+	+	+	+	+
TAB089	DR8	8031	+	+	-	+/-	+	+	+	+	+	+	+	+
DKB	DR9	9012	+	+	+/-	+/-	+	+	+	+	+	+	+	+/-
WT47	DR13	1302	+	+	-	+	+	+	+	+	+	+	+	+
TEM	DR14	1401	+	+	+/-	+/-	+	+	+	+	+	+	+	+
L105.1	DRw52	B3*0101	+	-	-	nt ^d	+	-	+	+	+	nt	nt	+/-
L257.6	DRw53	B4*0101	+/-	-	+	-	nt	+	-	+/-	+/-	nt	nt	+/-
L25.4	DPw4/w4.2	DP0103/0402	-	-	-	nt	+	-	-	-	-	nt	nt	+
L256.12	DPw2/w2.1	DP0202/0201	-	-	-	nt	+	+/-	-	-	-	nt	nt	+/-
L21.3	DQ7/w2	DQ0201/0602	-	-	-	nt	+	-	+	-	-	nt	nt	-
Target Cell			% Cells Killed ^e											
PRIESS			75	20	28	32	22	89	33	59	75	34	1	5
												88	93	74

a. FACS analysis, mAb + FITC-anti human IgG₄, mean fluorescence intensity > 30.

b. Mean fluorescence intensity < 10.

c. Mean fluorescence intensity 10-30.

d. Not tested.

e. Based on viable cell recovery after treatment with 200 nM scFv plus 100 nM anti-FLAG or 50 nM mab at 37 °C for 4h. Determined by light.

Figure 3

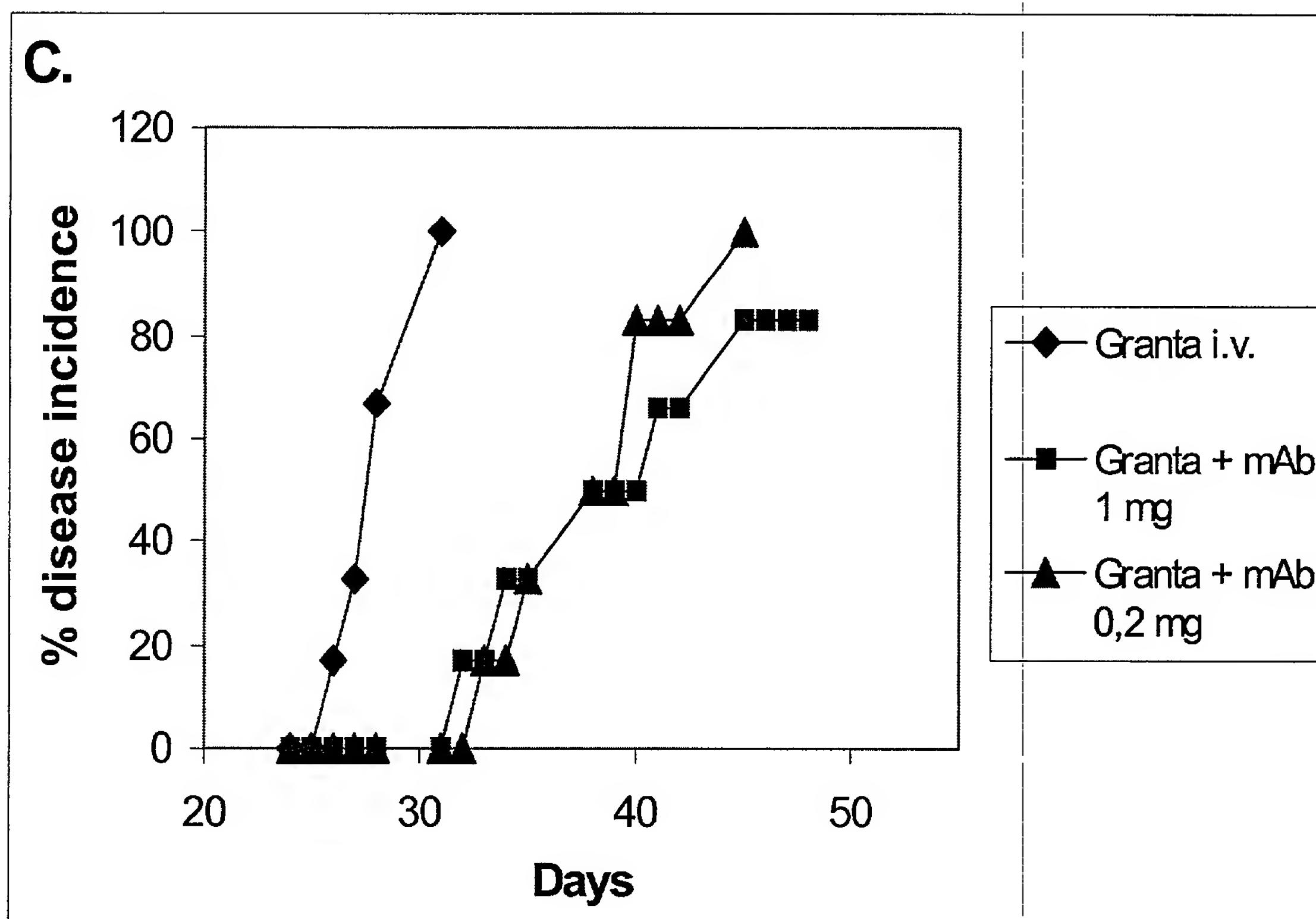


Figure 4

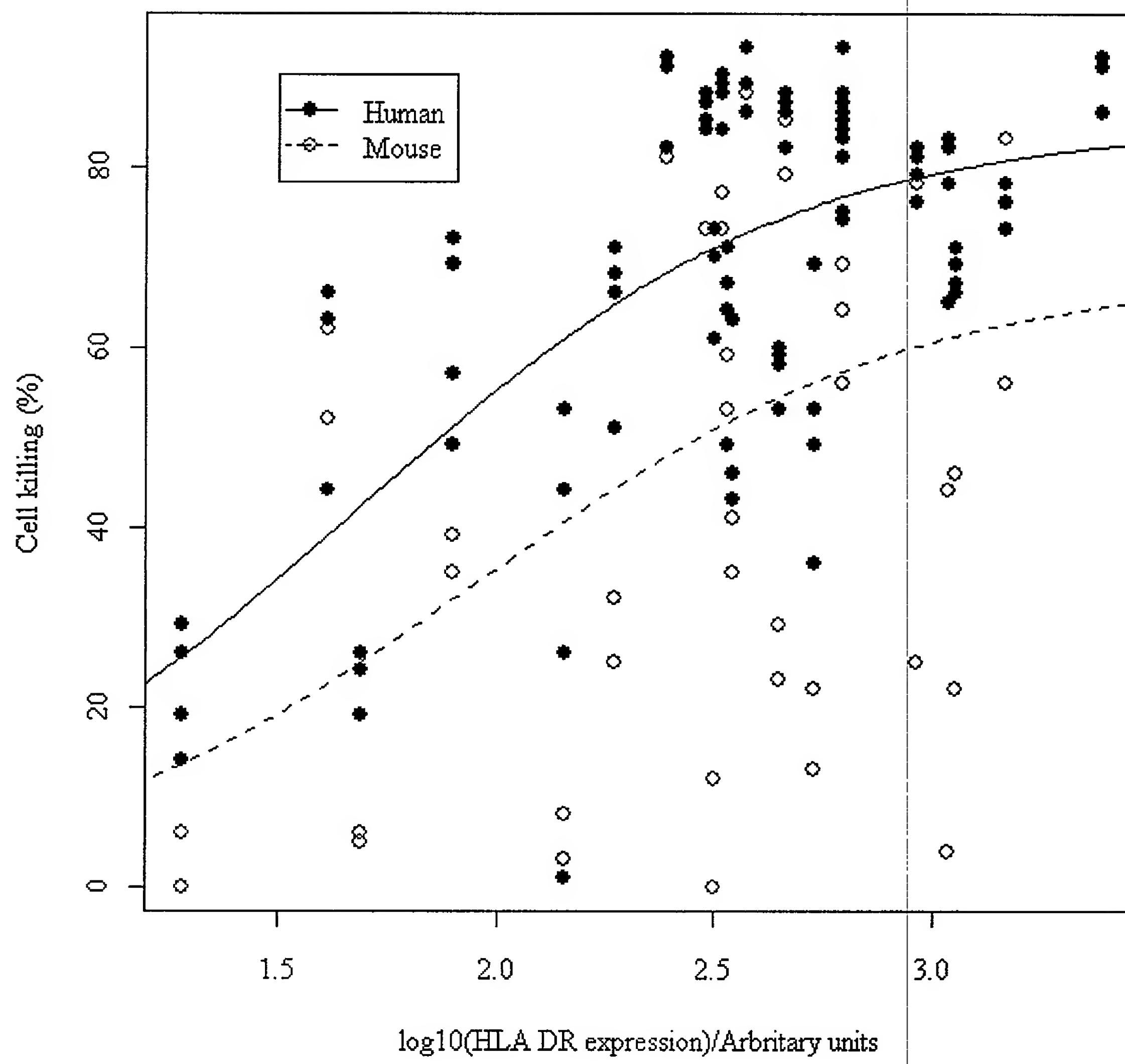


Figure 5

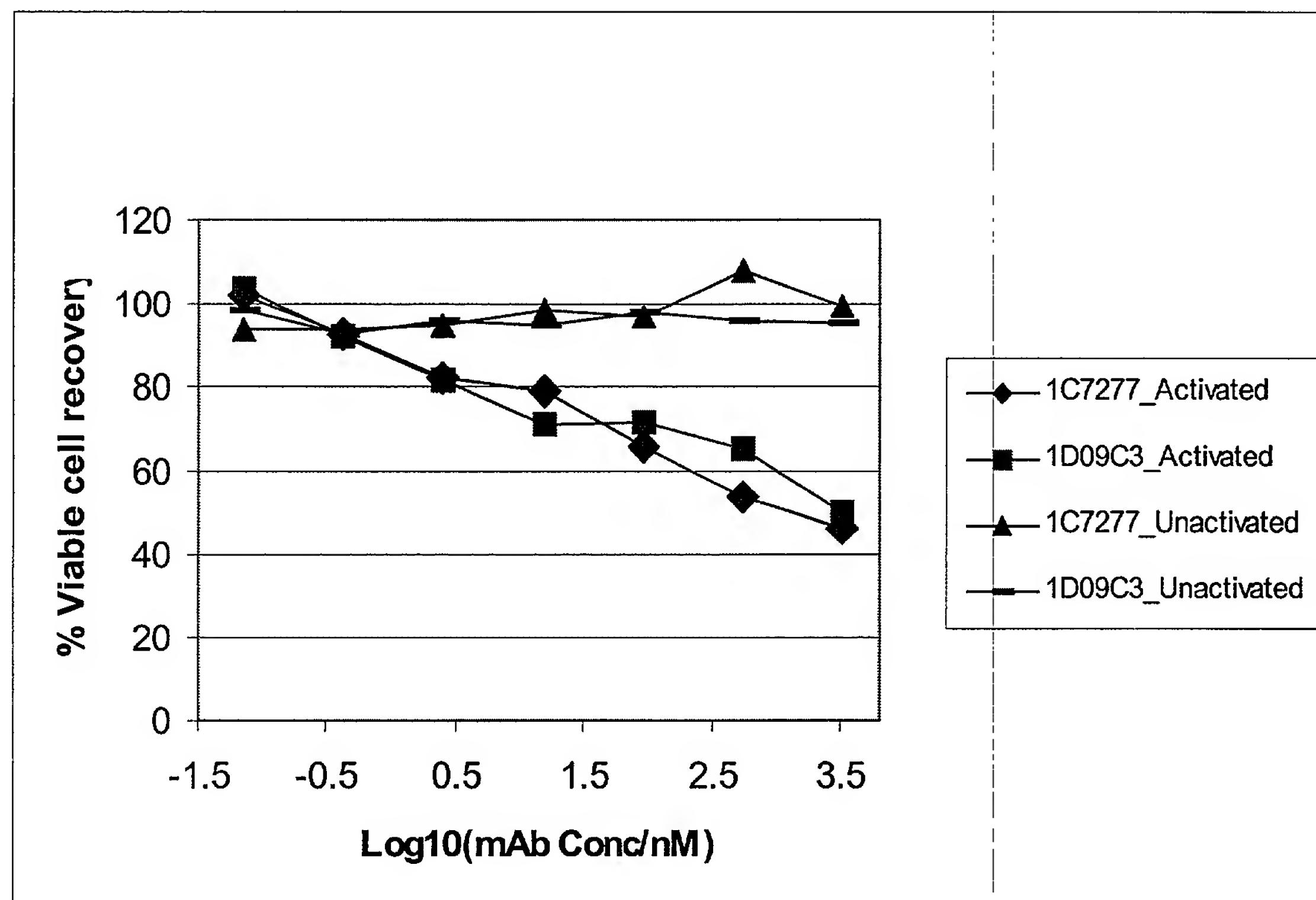


Figure 6a

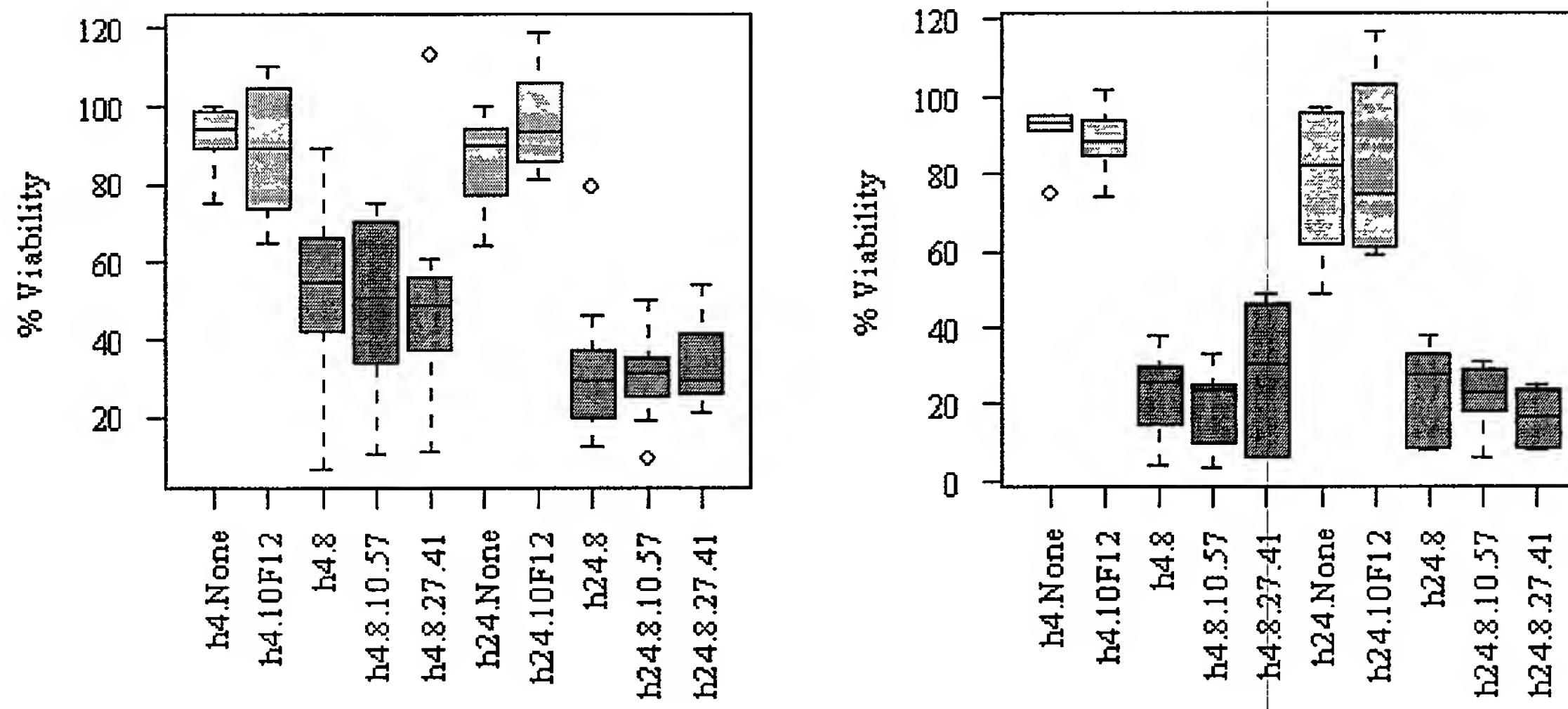


Figure 6b

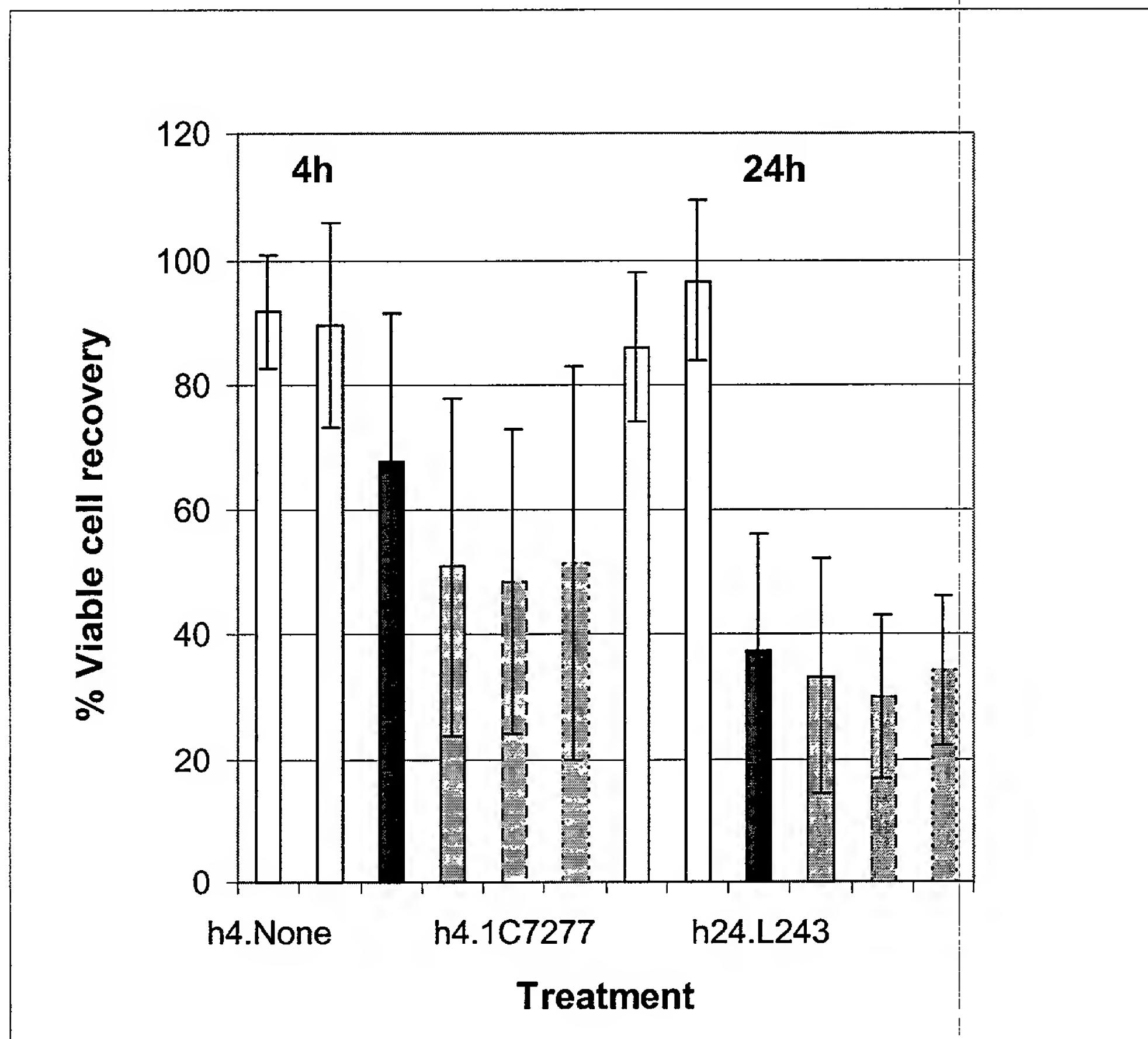


Figure 6c

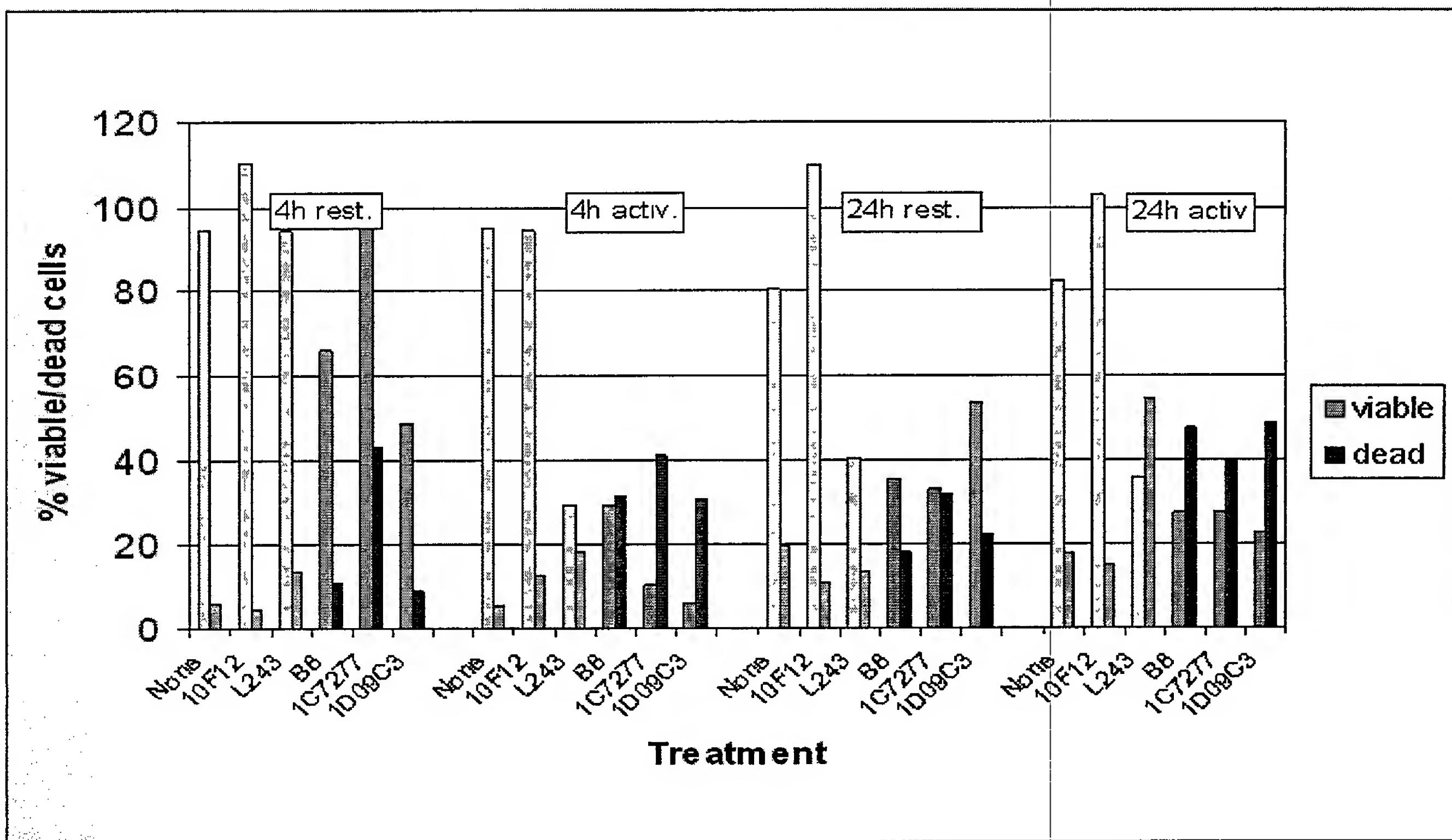


Figure 7a

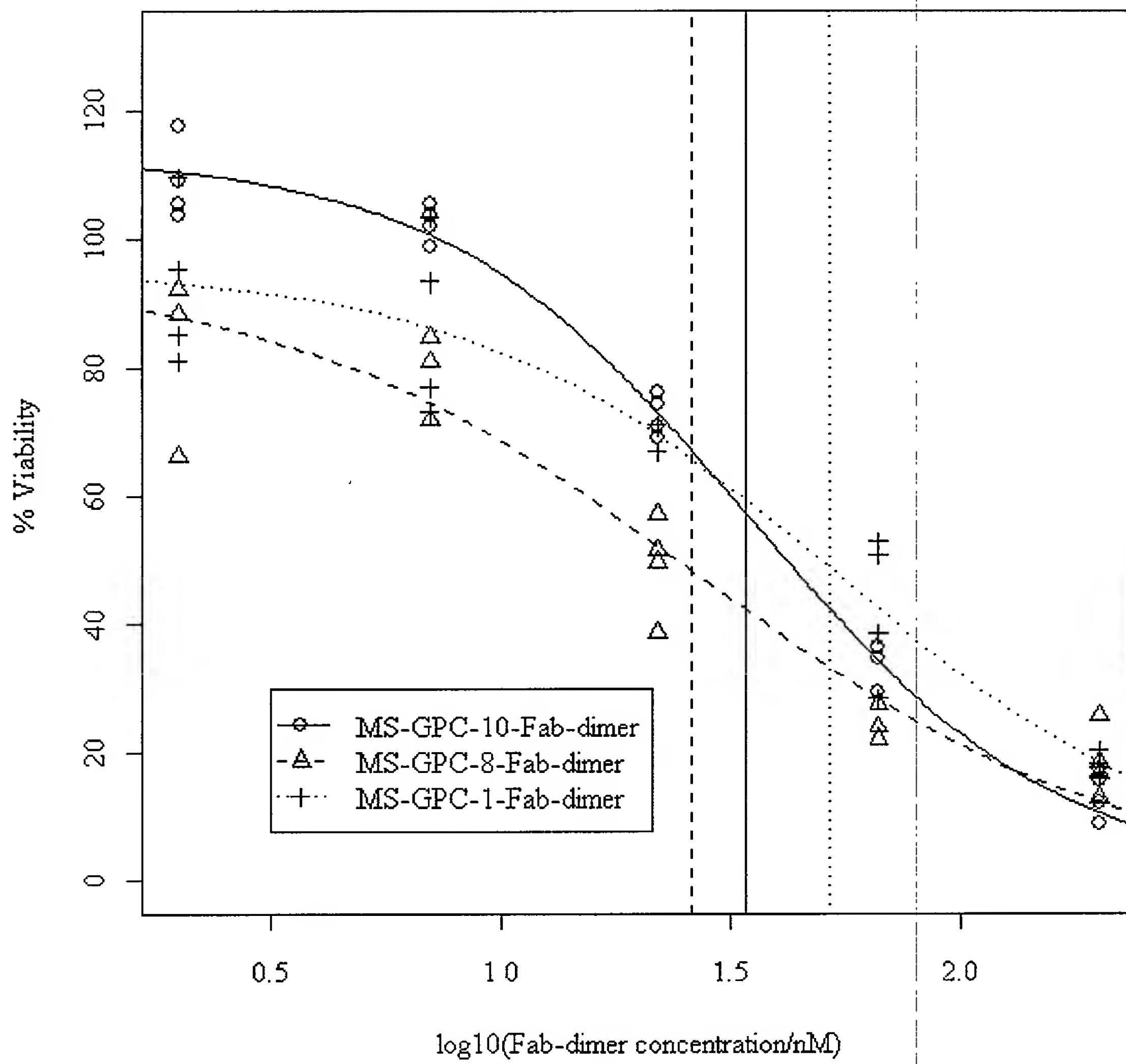


Figure 7b

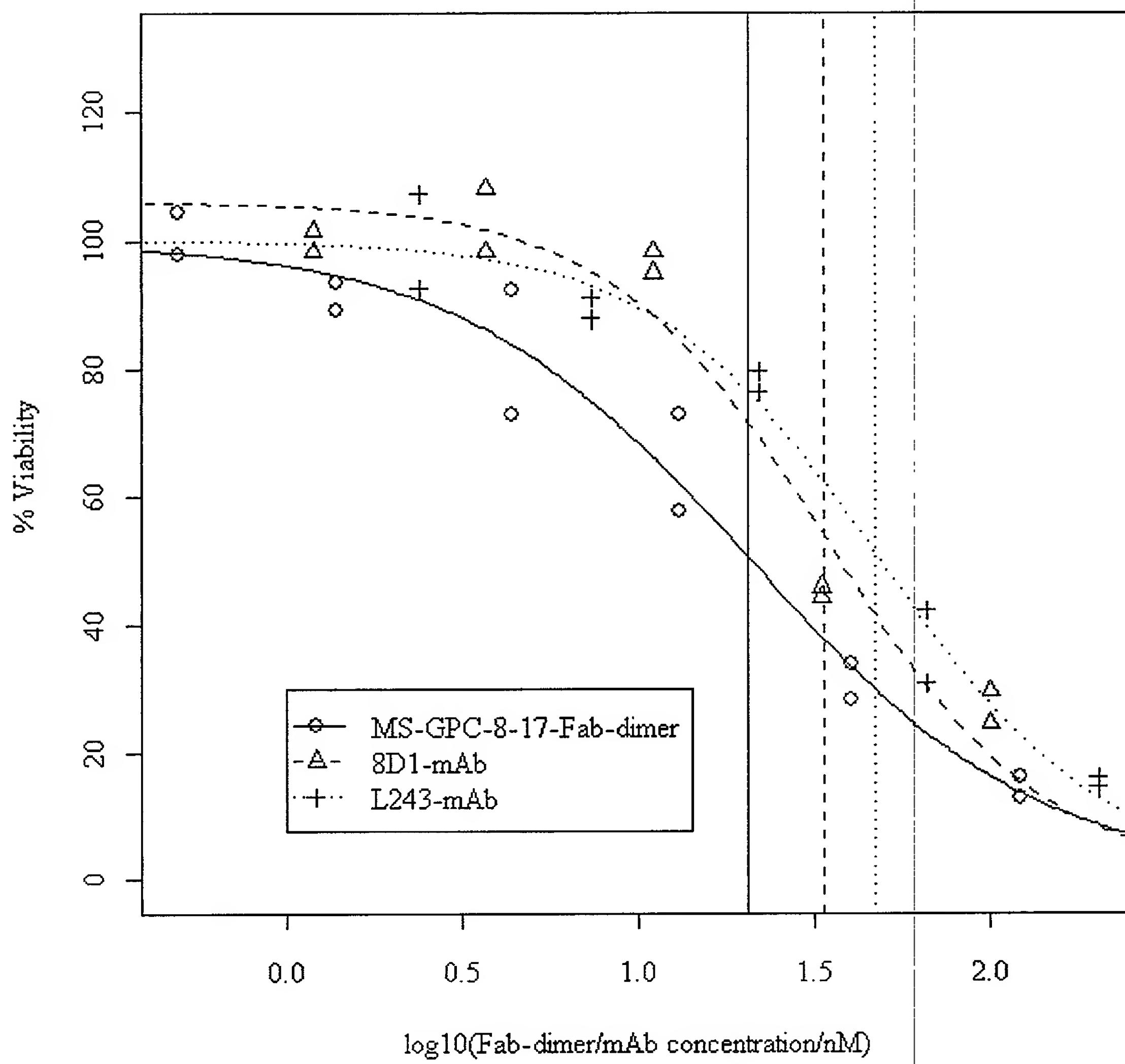


Figure 7c

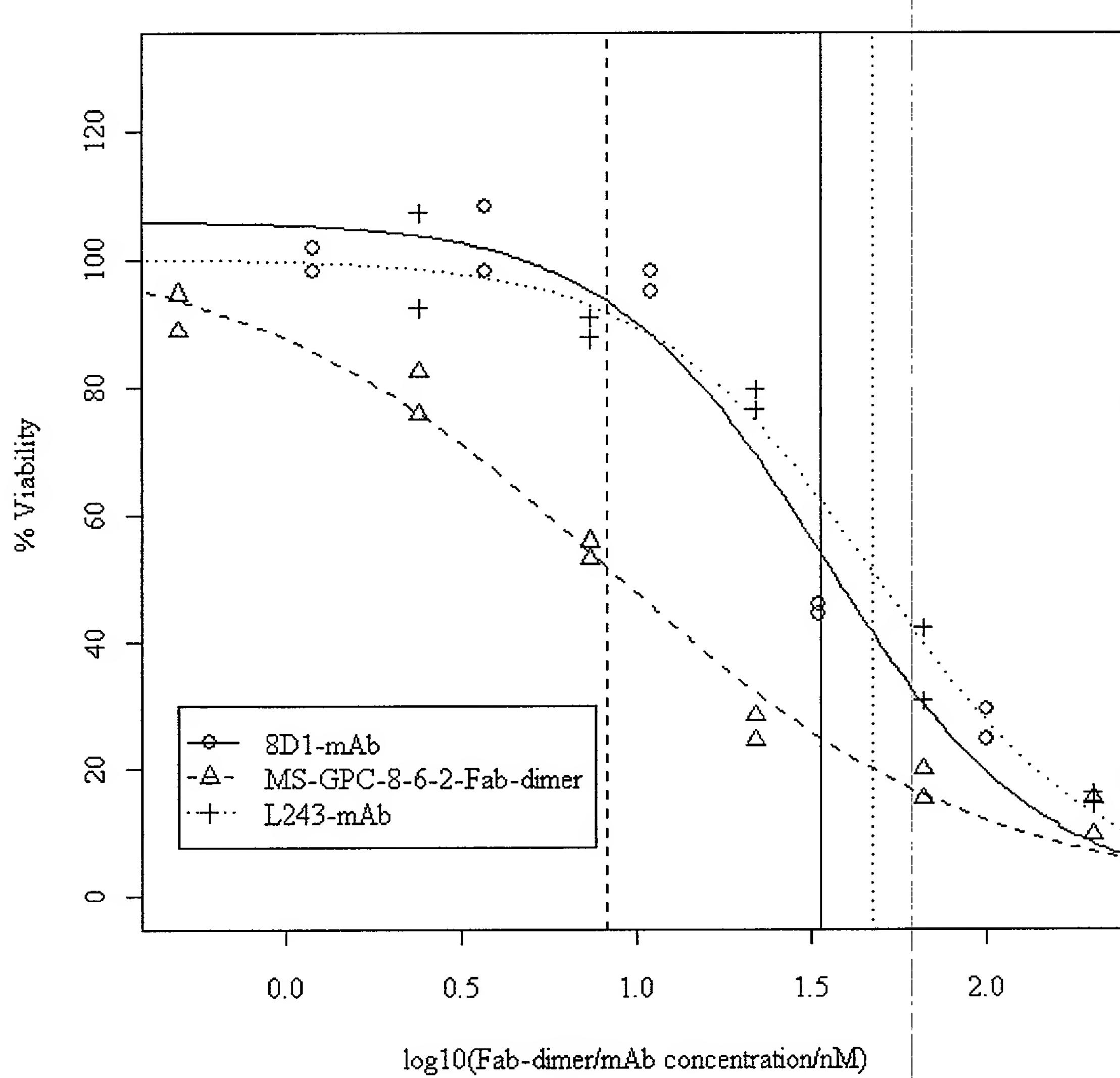


Figure 7d

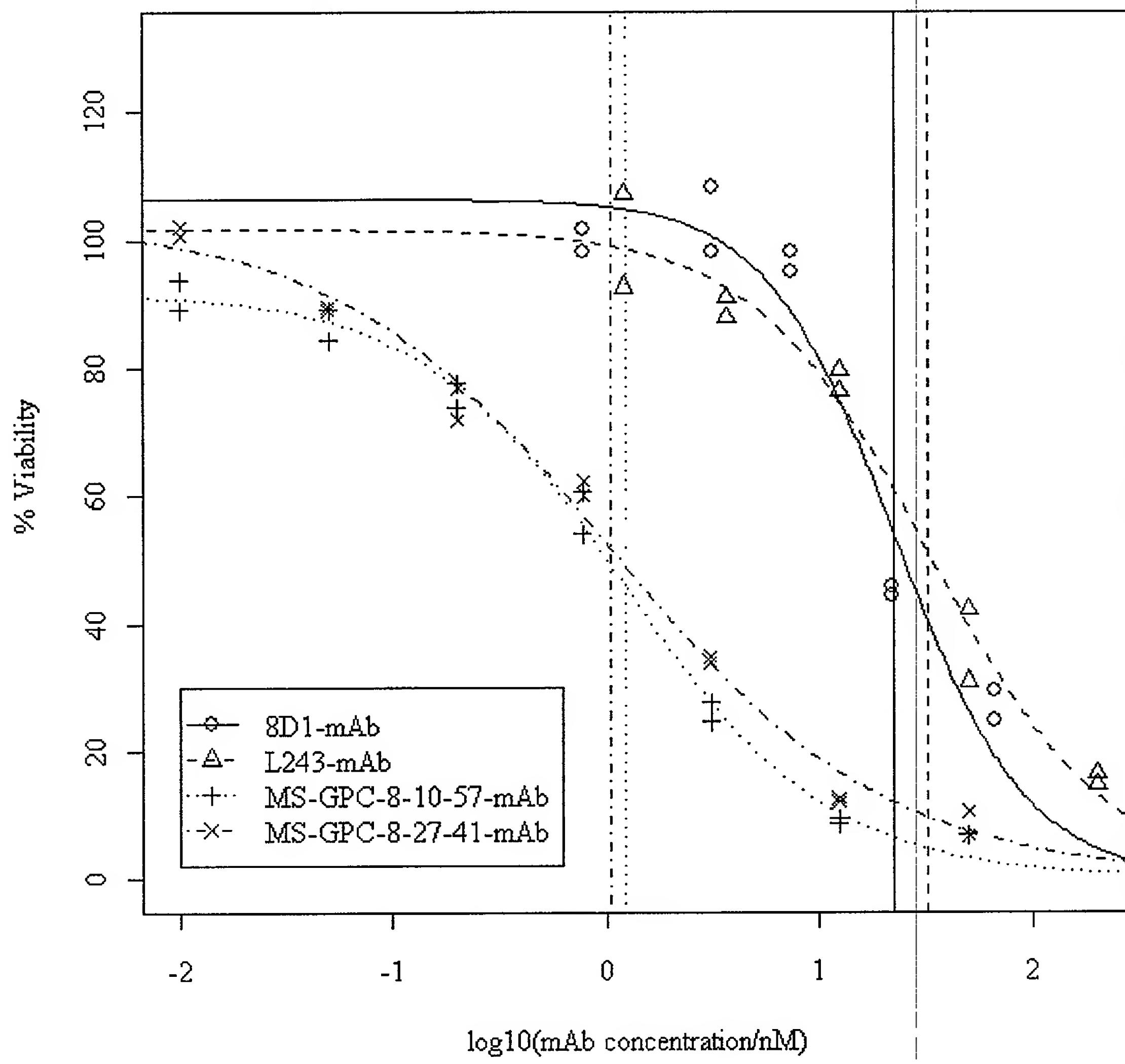


Figure 8a

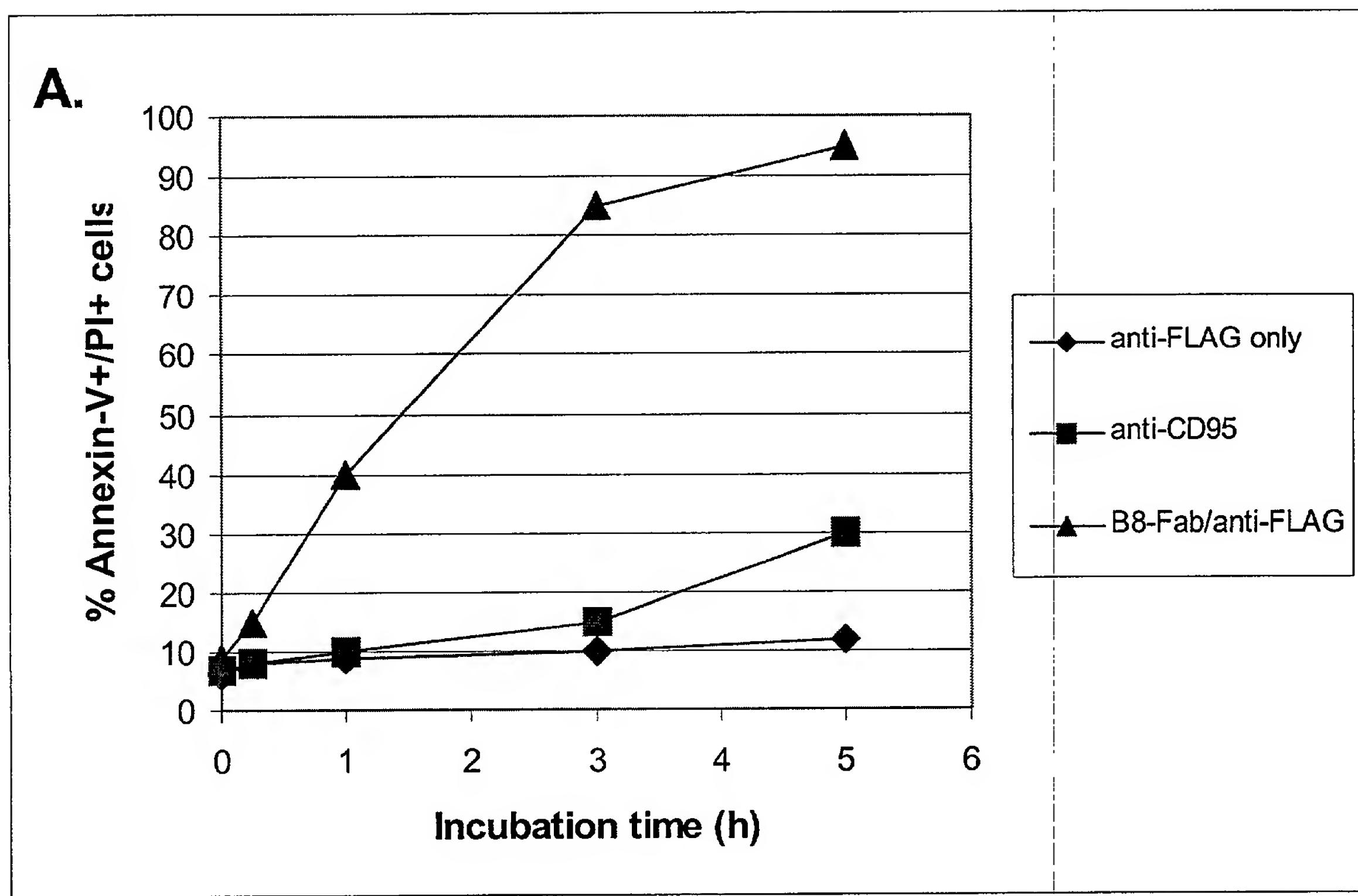


Figure 8b

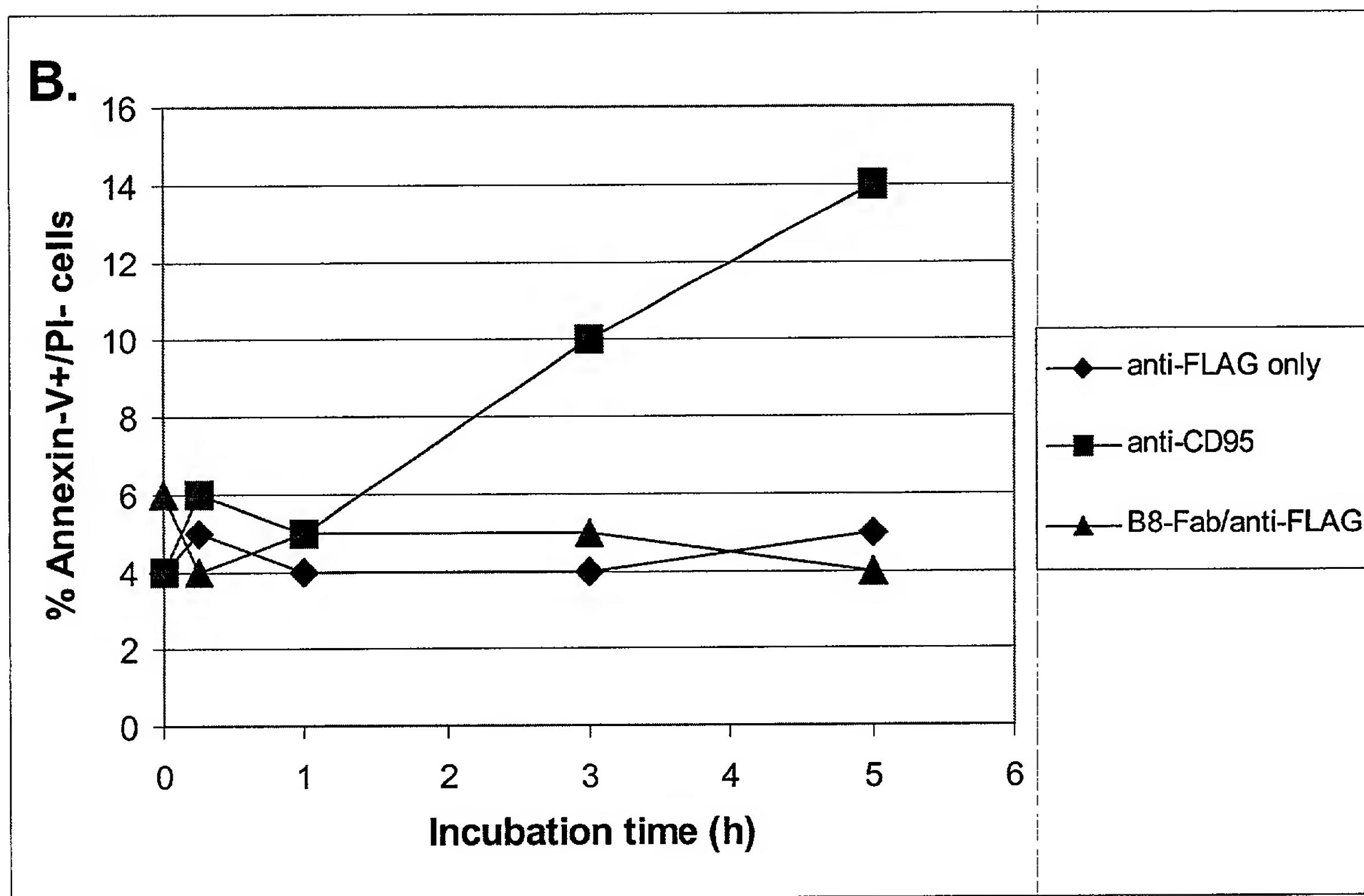


Figure 8c

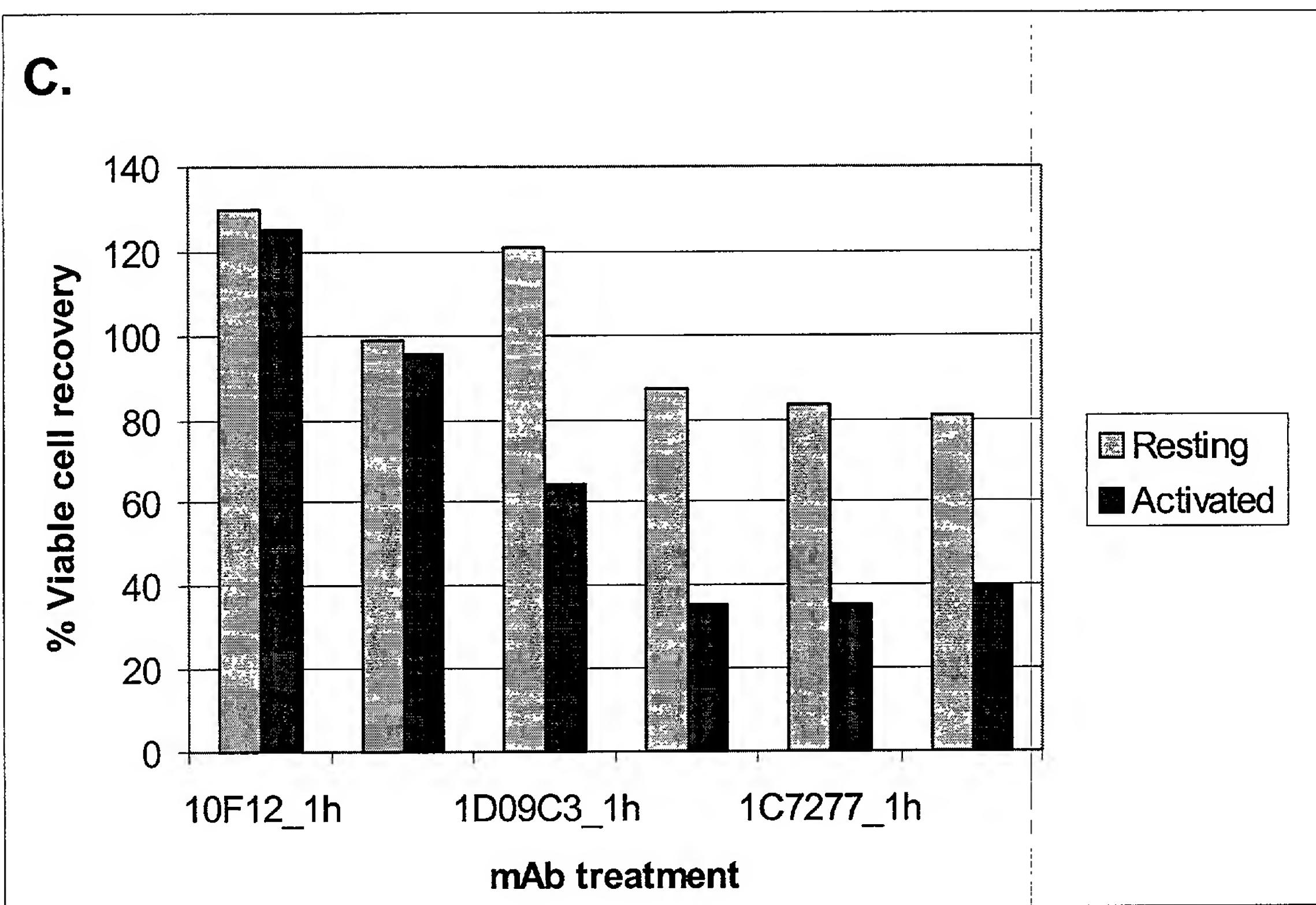


Figure 9a

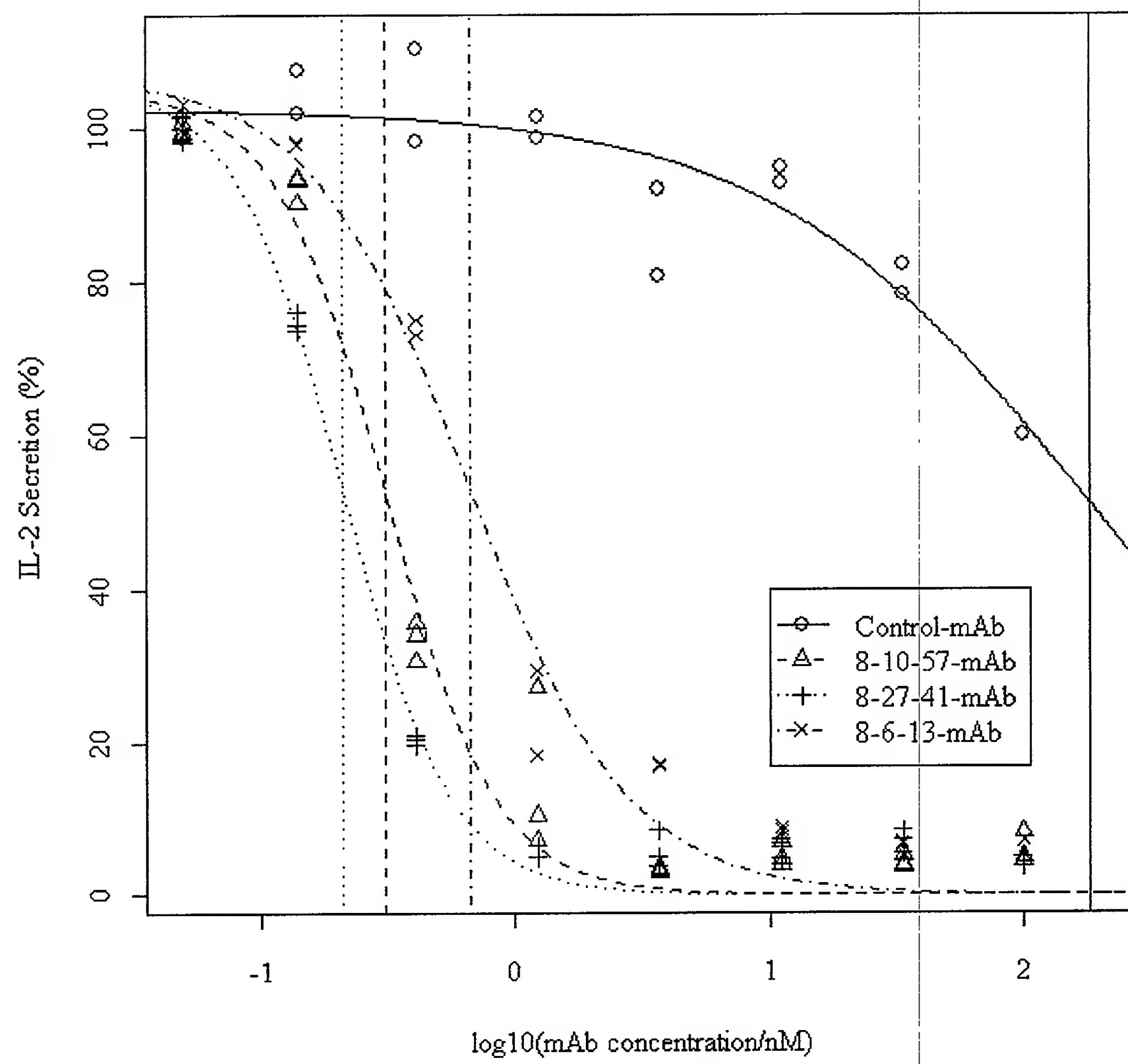


Figure 9b

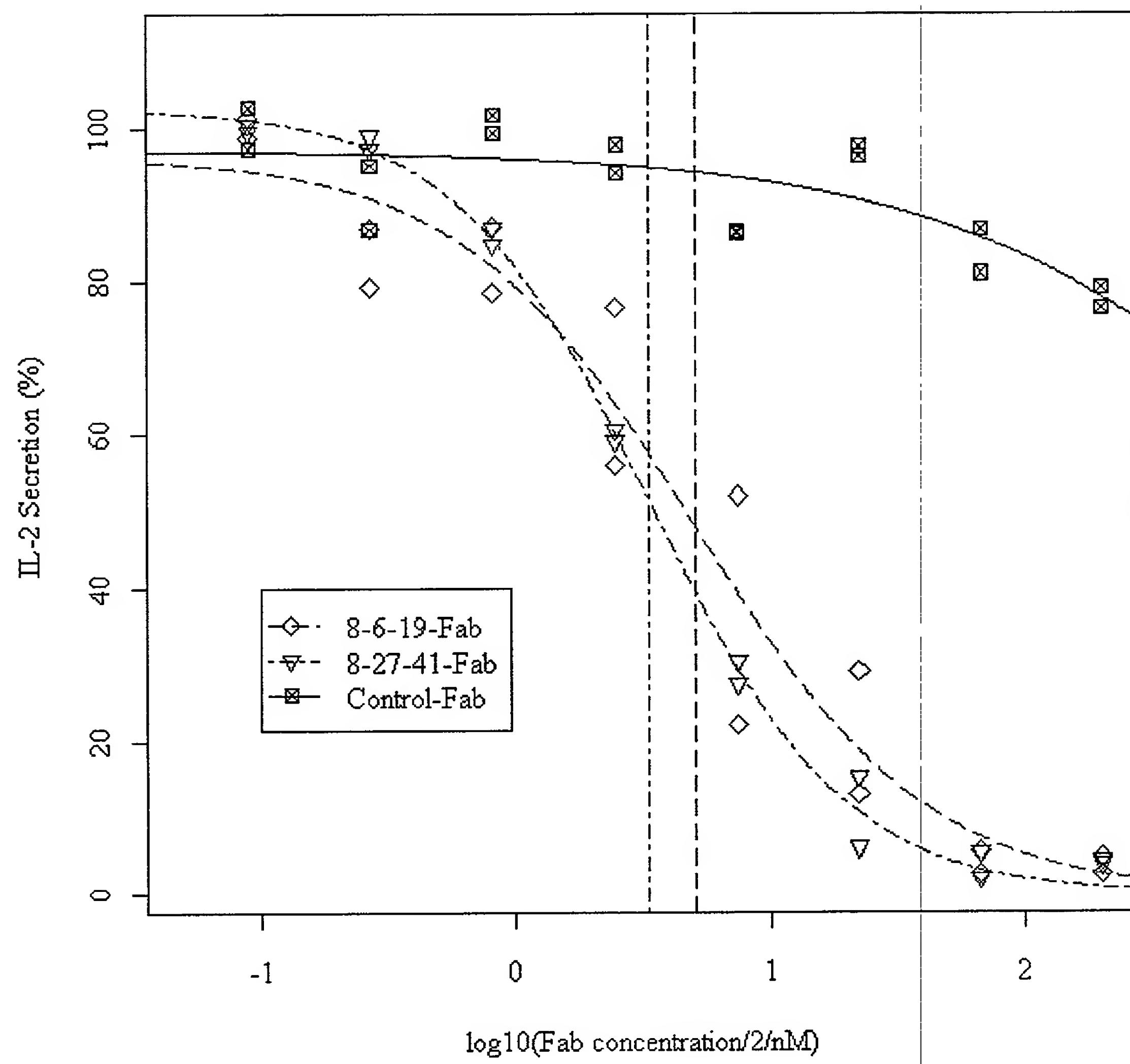


Figure 9c

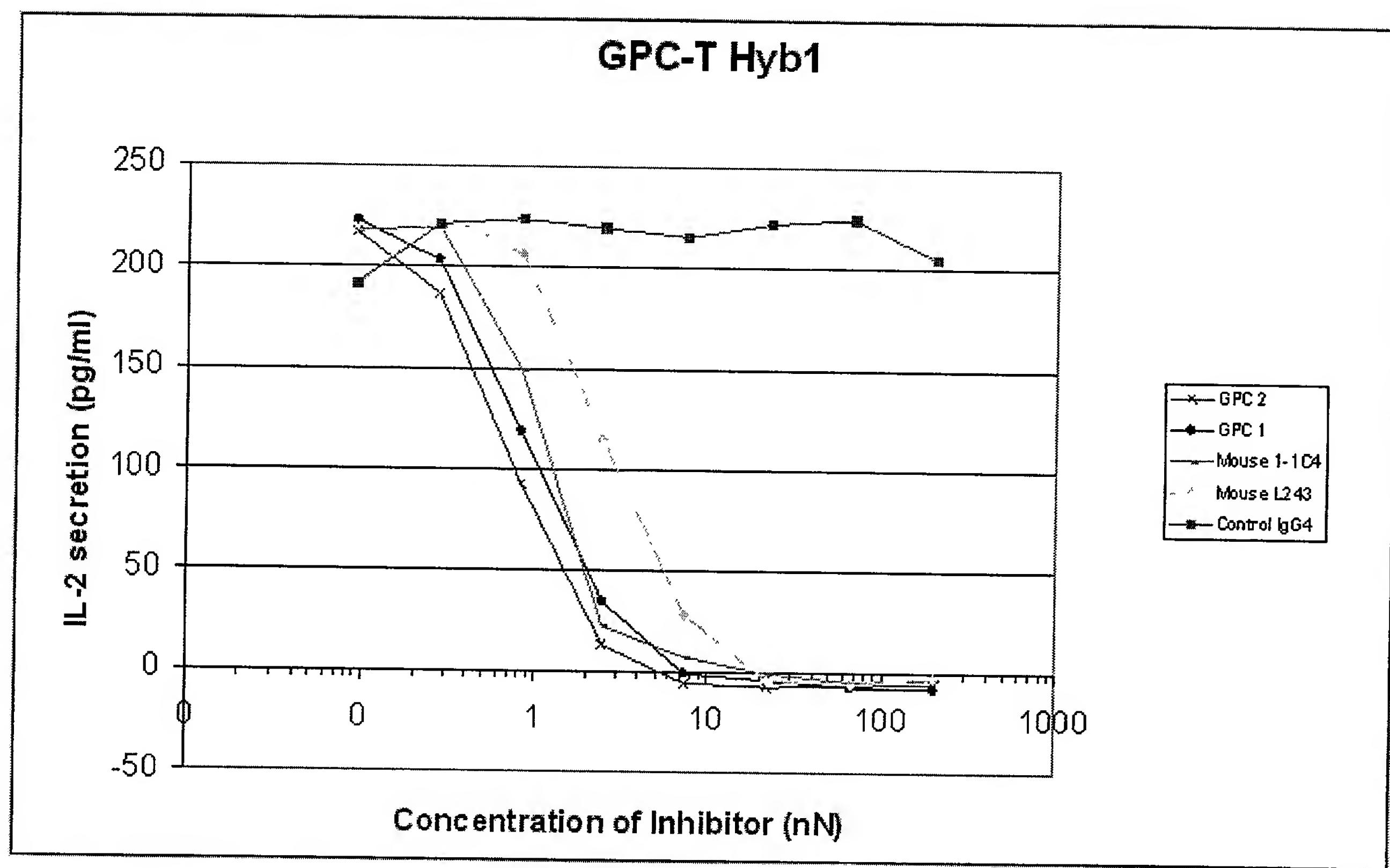


Figure 9d

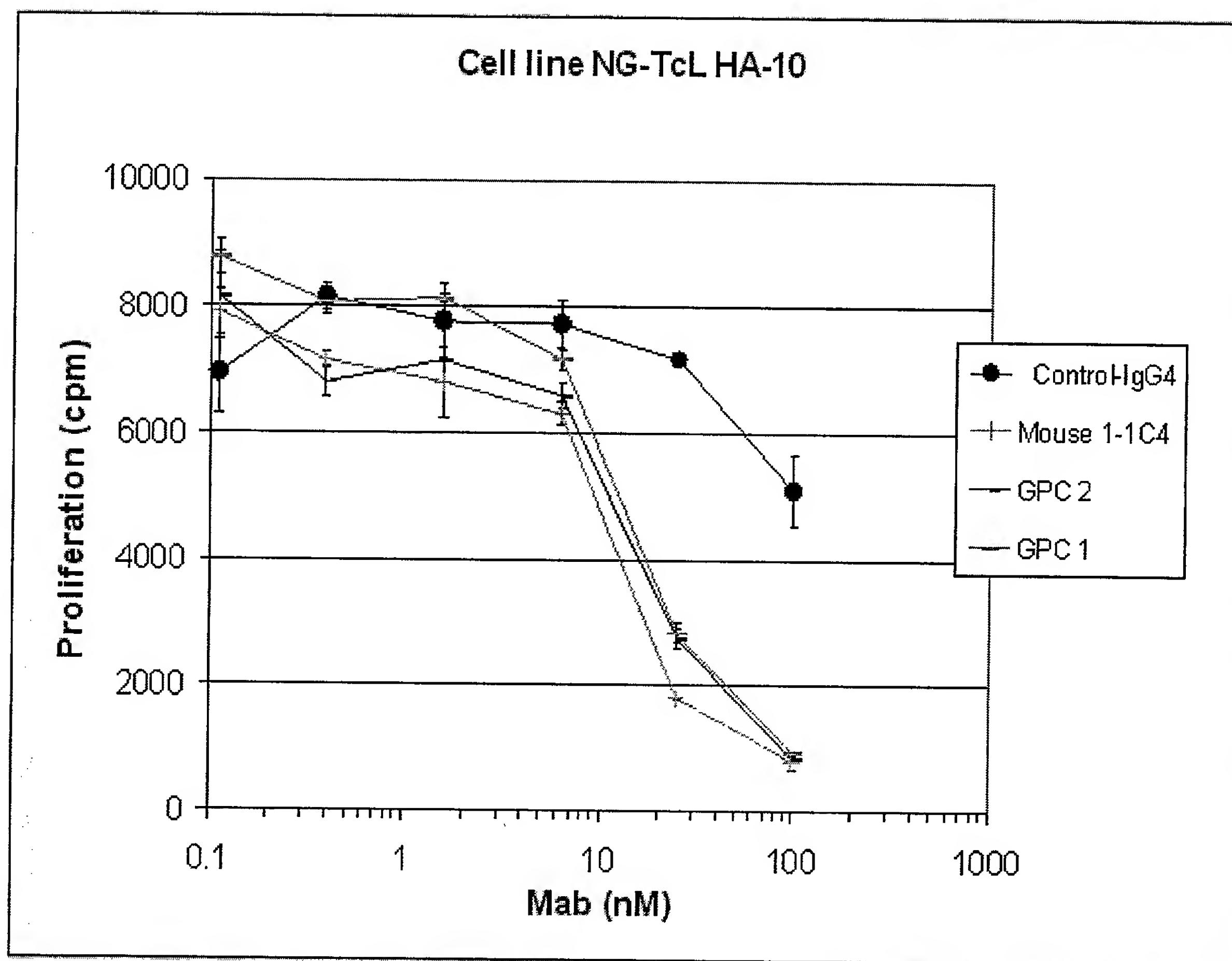


Figure 9e

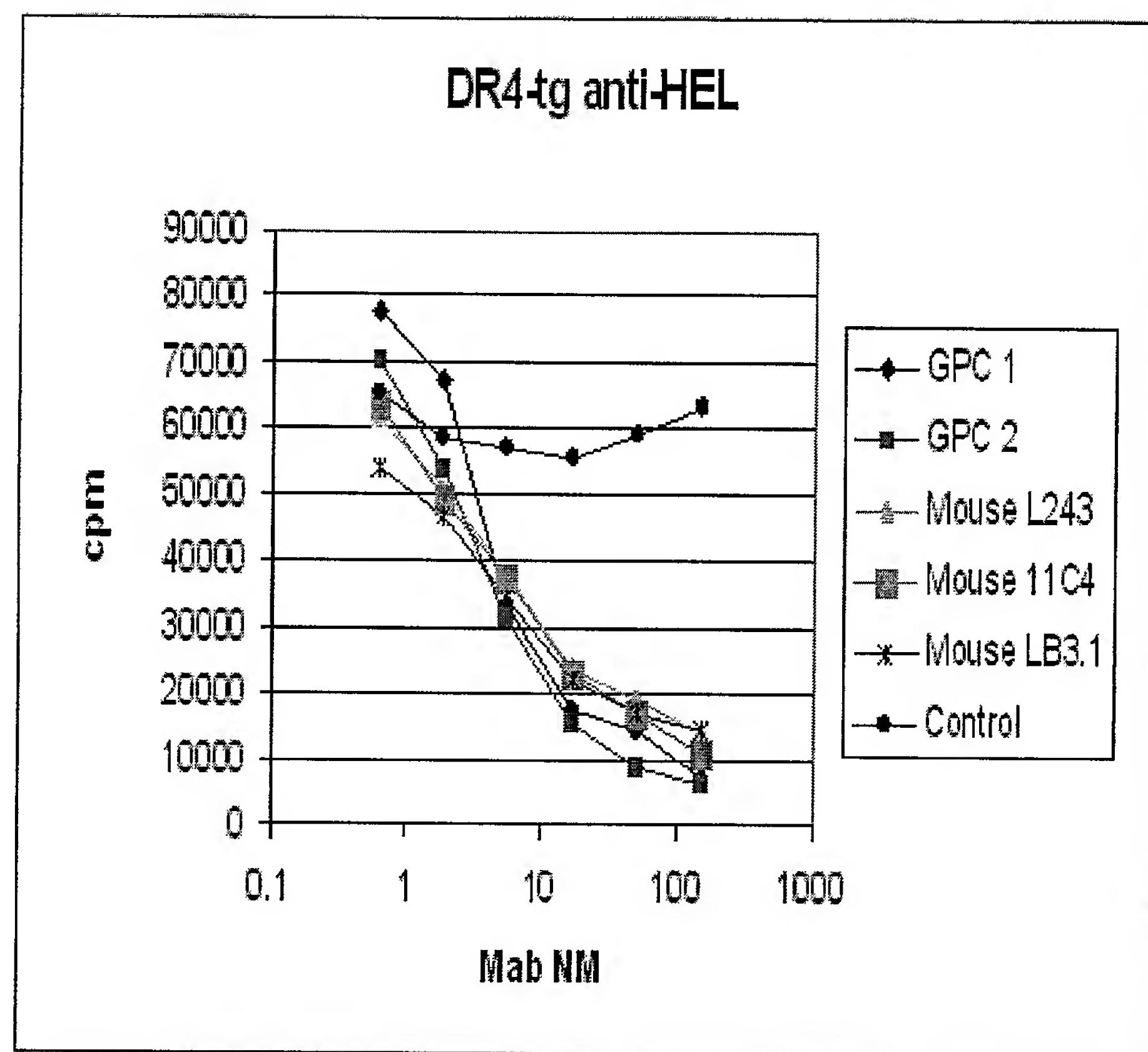


Figure 9f

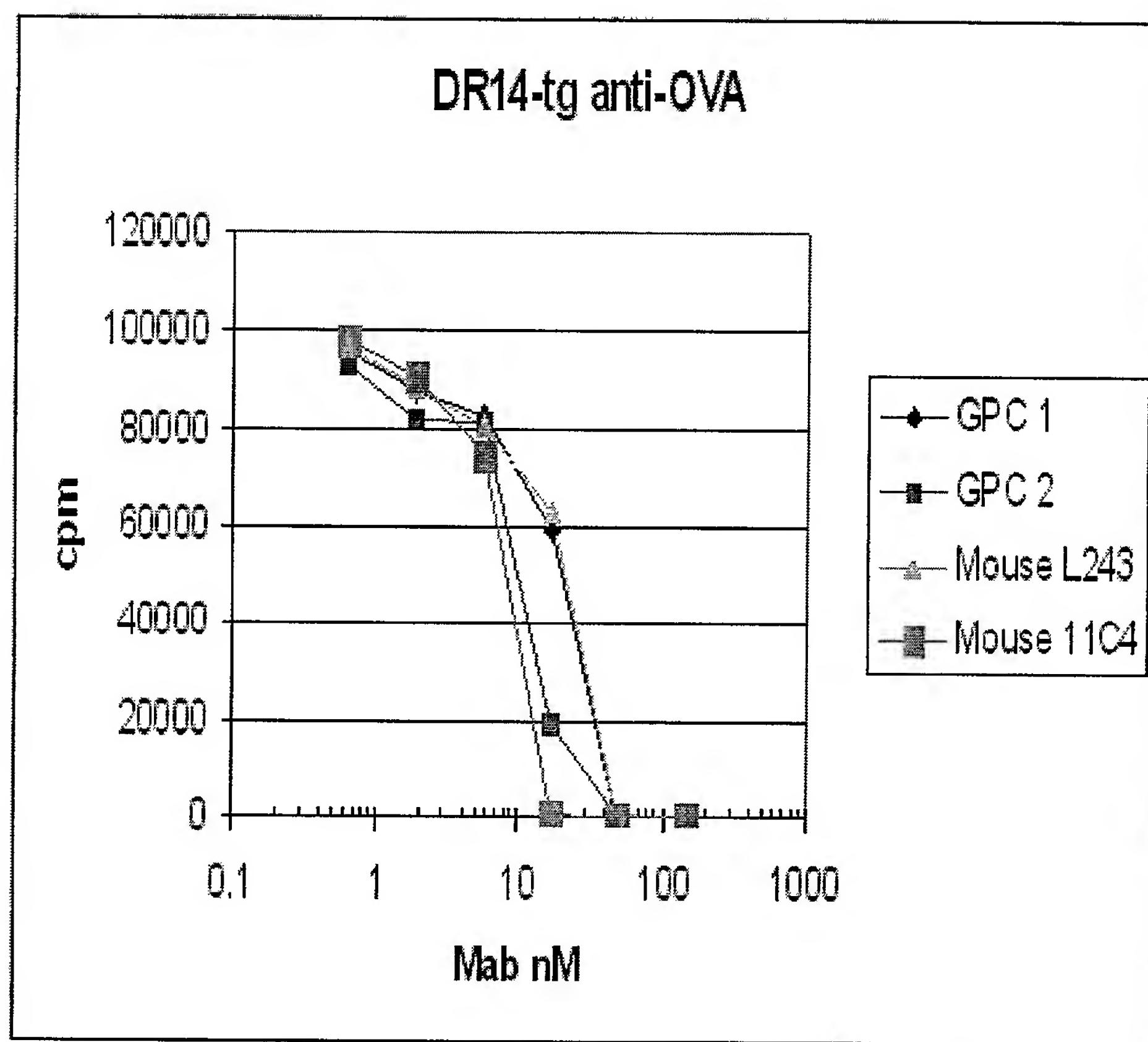


Figure 9g

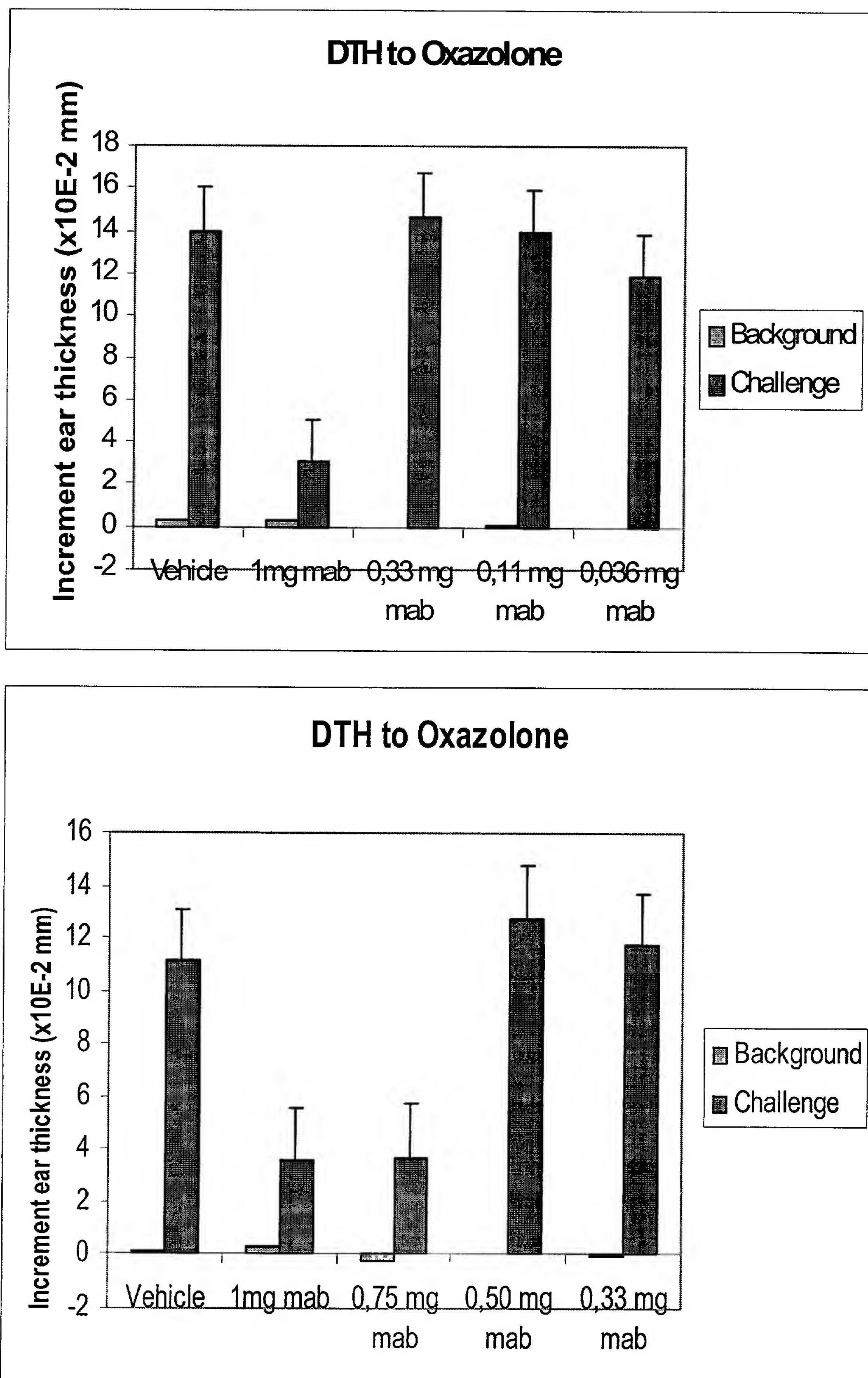
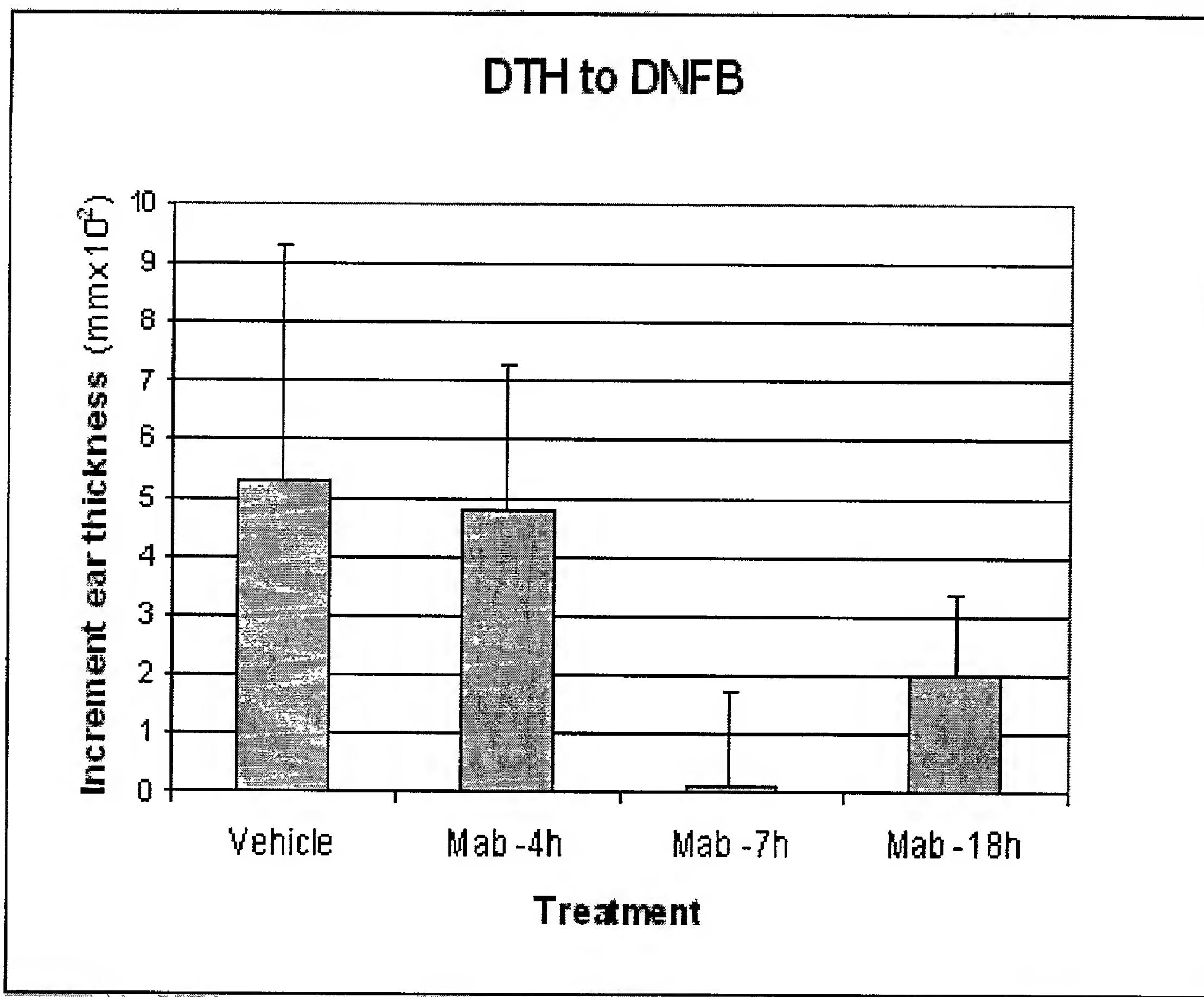
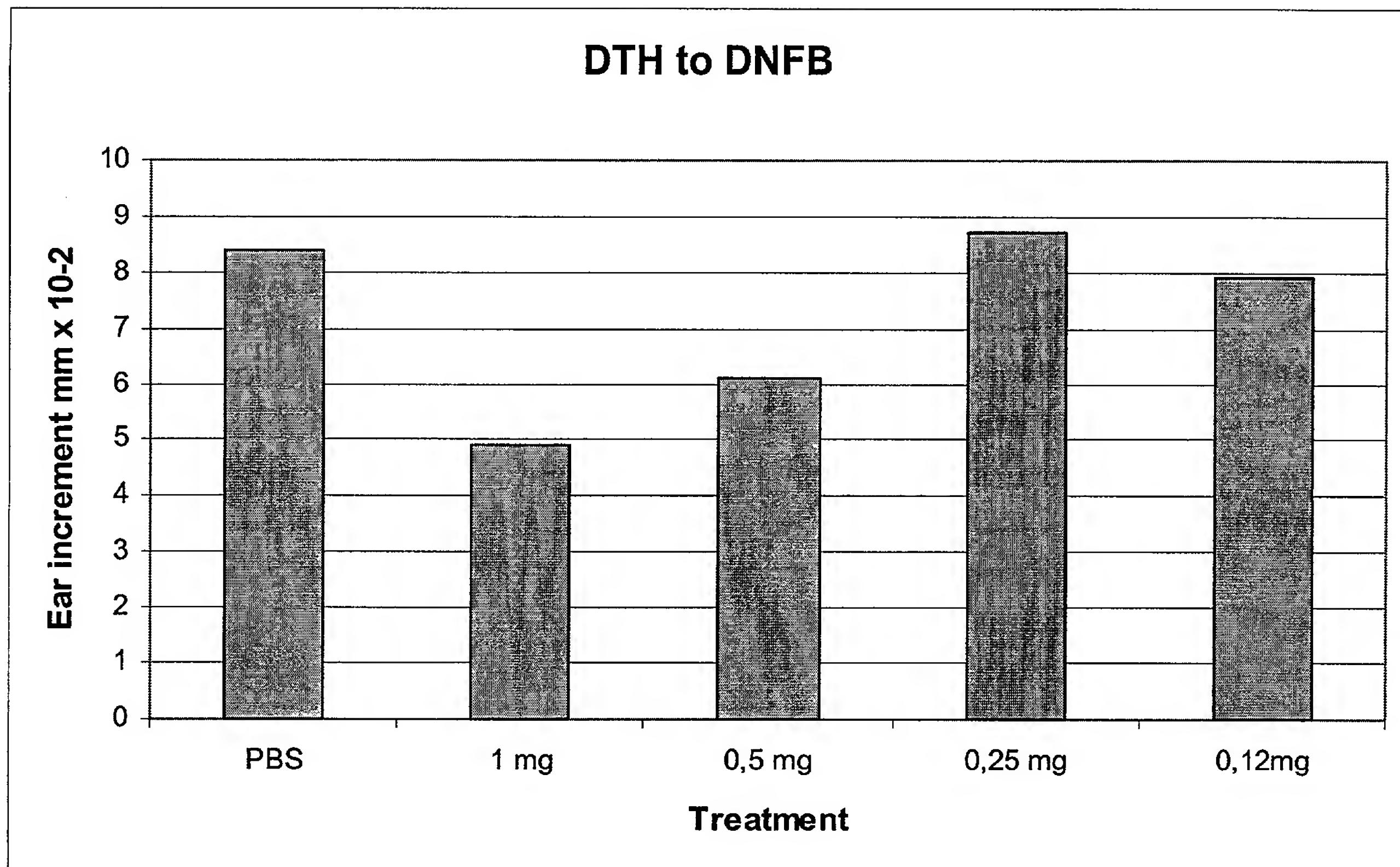


Figure 9h



mAb: 1D09C3

Figure 9I



mAb: 1D09C3

Figure 10

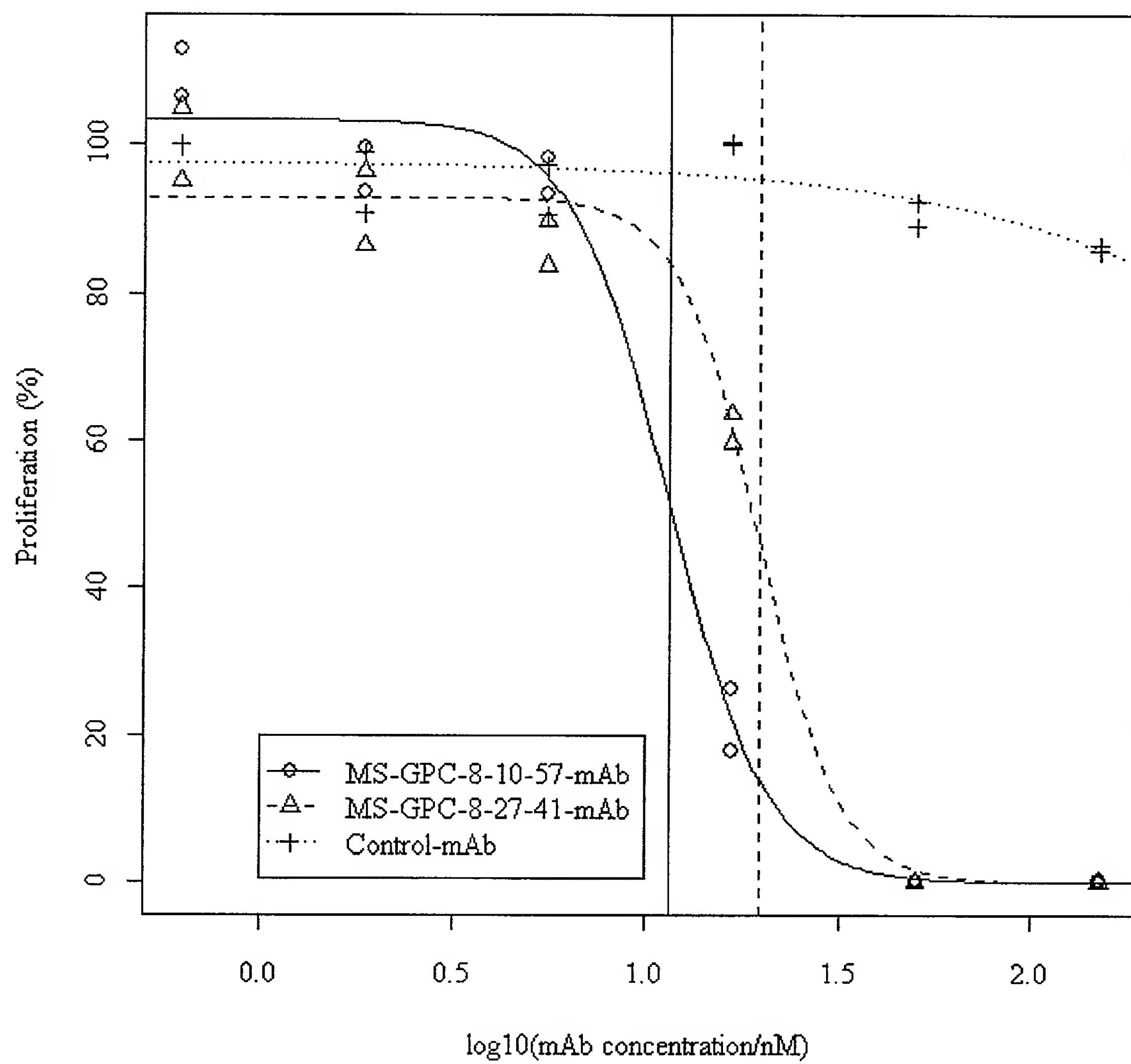


Figure 11

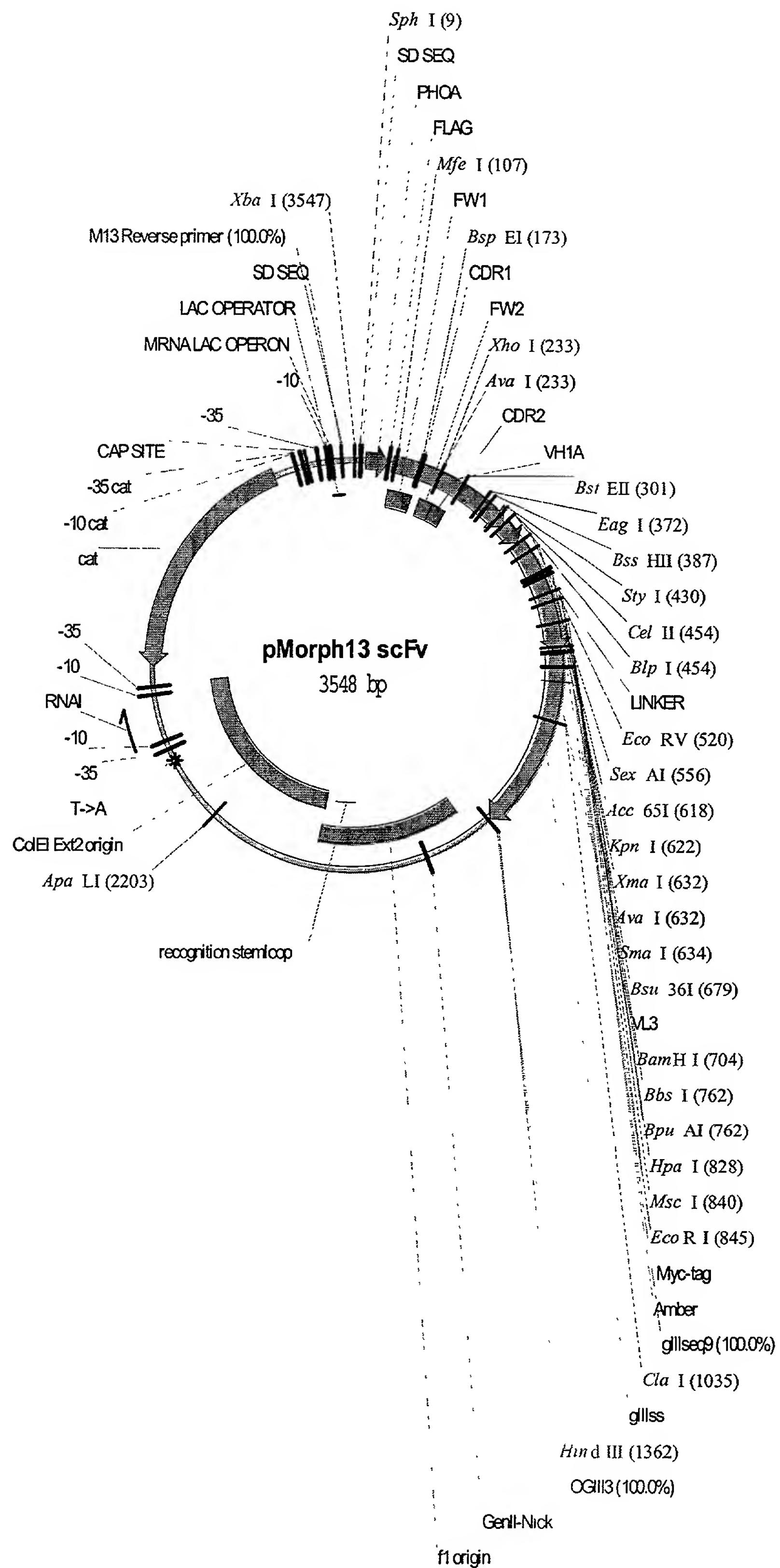


Figure 11 (cont.)

XbaISphI
~~~~~

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TCTCGTACGC ATCCTCTTT ATTTTACTTT GTTCGTGAT AACGTGACCG

51 ACTCTTACCG TTGCTCTTCA CCCCTGTTAC CAAAGCCGAC TACAAAGATG  
TGAGAATGGC AACGAGAAGT GGGGACAATG GTTCGGCTG ATGTTTCTAC

MfeI  
~~~~~

101 AAGTGCAATT GGTCAGTCT GGCGCGGAAG TGAAAAAACCG GGGCAGCAGC
TTCACGTTAA CCAAGTCAGA CCGCGCCTTC ACTTTTTGG CCCGTCGTCG

BspEI
~~~~~

151 GTGAAAGTGA GCTGCAAAGC CTCCGGAGGC ACTTTAGCA GCTATGCGAT  
CACTTCACT CGACGTTCG GAGGCCTCCG TGAAAATCGT CGATACGCTA

XhoI  
~~~~~

201 TAGCTGGTG CGCCAAGCCC CTGGCAGGG TCTCGAGTGG ATGGGCGGCA
ATCGACCCAC GCGGTTGGG GACCCGTCCC AGAGCTCACC TACCCGCCGT

BstEII
~

251 TTATTCCGAT TTTTGGCACG GCGAACTACG CGCAGAAGTT TCAGGGCCGG
AATAAGGCTA AAAACCGTGC CGCTTGATGC GCGTCTTCAA AGTCCCAGGCC

BstEII
~~~~~

301 GTGACCATTA CCGCGGATGA AAGCACCAAGC ACCCGTATA TGGAACTGAG  
CACTGGTAAT GGCGCCTACT TTCGTGGTCG TGGCGCATAT ACCTTGACTC

EagI BssHII  
~~~~~

351 CAGCCTGCGT AGCGAAGATA CGGCCGTGTA TTATTGCGCG CGTTATTATG
GTCGGACGCA TCGCTTCTAT GCCGGCACAT AATAACGCGC GCAATAATAC

StyI
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401 ATCGTATGTA TAATATGGAT TATTGGGCC AAGGCACCT GGTGACGGTT  
TAGCATACAT ATTATACCTA ATAACCCCGG TTCCGTGGGA CCACTGCCAA

BpuI  
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CelII
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451 AGCTCAGCGG GTGGCGGTTC TGGCGGCGGT GGGAGCGGTG GCGGTGGTTC  
TCGAGTCGCC CACCGCCAAG ACCGCCGCCA CCCTCGCCAC CGCCACCAAG

EcoRV  
~~~~~

501 TGGCGGTGGT GGTTCCGATA TCGAACTGAC CCAGCCGCCT TCAGTGAGCG

ACCGCCACCA CCAAGGCTAT AGCTTGACTG GGTCGGCGGA AGTCACTCGC

SexAI

~~~~~

551 TTGCACCAGG TCAGACCGCG CGTATCTCGT GTAGCGGCGA TGCGCTGGGC  
AACGTGGTCC AGTCTGGCGC GCATAGAGCA CATCGCCGCT ACGCGACCCG

XmaI

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KpnI

SmaI

~~~~~

Acc65I

AvaI

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601 GATAAAATACG CGAGCTGGTA CCAGCAGAAA CCCGGGCAGG CGCCAGTTCT
CTATTTATGC GCTCGACCAT GGTCGTCTTT GGGCCCGTCC GCGGTCAAGA

Bsu36I

~~~~~

651 GGTGATTAT GATGATTCTG ACCGTCCCTC AGGCATCCCG GAACGCTTAA  
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BamHI

~~~~~

701 GCGGATCCAA CAGCGGCAAC ACCGCGACCC TGACCATTAG CGGCACACTCAG
CGCCTAGGTT GTCGCCGTTG TGGCGCTGGG ACTGGTAATC GCCGTGAGTC

BpuAI

~~~~~

BbsI

~~~~~

751 GCGGAAGACG AAGCGGATTA TTATTGCCAG AGCTATGACG CTCATATGCG
CGCCTTCTGC TTCGCCTAAT AATAACGGTC TCGATACTGC GAGTATAACGC

HpaI

MscI

EcoRI

~~~~~

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AGGACACAAA CCGCCGCCGT GCTTCAATTG GCAAGAACCG GTCCTTAAGC

851 AGCAGAAGCT GATCTCTGAG GAGGATCTGA ACTAGGGTGG TGGCTCTGGT  
TCGTCTTCGA CTAGAGACTC CTCCTAGACT TGATCCCACC ACCGAGACCA

901 TCCGGTGATT TTGATTATGA AAAGATGGCA AACGCTAATA AGGGGGCTAT  
AGGCCACTAA AACTAATACT TTTCTACCCT TTGCGATTAT TCCCCCGATA  
gIIIseq9 100.0%

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951 GACCGAAAAT GCCGATGAAA ACGCGCTACA GTCTGACGCT AAAGGCAAAC  
CTGGCTTTA CGGCTACTTT TGCGCGATGT CAGACTGCGA TTTCCGTTG

ClaI

~~~~~

1001 TTGATTCTGT CGCTACTGAT TACGGTGCTG CTATCGATGG TTTCATTGGT
AACTAAGACA GCGATGACTA ATGCCACGAC GATAGCTACC AAAGTAACCA

1051 GACGTTCCG GCCTTGCTAA TGGTAATGGT GCTACTGGTG ATTTTGCTGG
CTGCAAAGGC CGGAACGATT ACCATTACCA CGATGACCAC TAAAACGACC

1101 CTCTAATTCC CAAATGGCTC AAGTCGGTGA CGGTGATAAT TCACCTTAA
GAGATTAAGG GTTTACCGAG TTCAGCCACT GCCACTATTA AGTGGAAATT
1151 TGAATAATTT CCGTCAATAT TTACCTTCCC TCCCTCAATC GGTTGAATGT
ACTTATTAAA GGCAGTTATA AATGGAAGGG AGGGAGTTAG CCAACTTACA
1201 CGCCCTTTG TCTTGCGC TGGTAAACCA TATGAATTCTT CTATTGATTG
GCGGGAAAAC AGAAACCGCG ACCATTTGGT ATACTTAAA GATAACTAAC
1251 TGACAAAATA AACTTATTCC GTGGTGTCTT TGCCTTCTT TTATATGTTG
ACTGTTTAT TTGAATAAGG CACCACAGAA ACGCAAAGAA AATATACAAC
1301 CCACCTTAT GTATGTATTT TCTACGTTG CTAACATACT GCGTAATAAG
GGTGGAAATA CATACTAAA AGATGCAAAC GATTGTATGA CGCATTATTC

HindIII

~~~~~

1351 GAGTCTTGAT AAGCTTGACC TGTGAAGTGA AAAATGGCGC AGATTGTGCG  
CTCAGAACTA TTCGAACCTGG ACACCTCACT TTTACCGCG TCTAACACGC  
OGIII 100.0%

=====

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ATTTAAGCG CAATTAAAAA ACAATTAGT CGAGTAAAAA ATTGGTTATC  
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TGATTTAGCC TTGGGATTTC CCTCGGGGGC TAAATCTCGA ACTGCCCTT  
1751 AGCCGGCGAA CGTGGCGAGA AAGGAAGGGA AGAAAGCGAA AGGAGCGGGC  
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1801 GCTAGGGCGC TGGCAAGTGT AGCGGTACCG CTGCGCGTAA CCACCACACC  
CGATCCCCGCG ACCGTTACAA TCGCCAGTGC GACGCGCATT GGTGGTGTGG  
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GCGGCGCGAA TTACGCGGCG ATGTCCCGCG CACGATCGGT ACACTCGTT  
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2001 CAGAGGTGGC GAAACCCGAC AGGACTATAA AGATACCAGG CGTTTCCCCC  
GTCTCCACCG CTTTGGGCTG TCCTGATATT TCTATGGTCC GCAAAGGGGG  
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ACCTTCGAGG GAGCACGCGA GAGGACAAGG CTGGGACGGC GAATGGCCTA  
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2151 CGCTGTAGGT ATCTCAGTTC GGTGTAGGTC GTTCGCTCCA AGCTGGGCTG  
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ApaLI

~~~~~

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2251 ATCGTCTTGA GTCCAACCCG GTAAGACACG ACTTATCGCC ACTGGCAGCA
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3201 CAGCTGAACG GTCTGGTTAT AGGTACATTG AGCAACTGAC TGAAATGCCT
GTCGACTTGC CAGACCAATA TCCATGTAAC TCGTTGACTG ACTTTACGGA
3251 CAAAATGTTT TTTACGATGC CATTGGATA TATCAACGGT GGTATATCCA
GTTTACAAG AAATGCTACG GTAACCCTAT ATAGTTGCCA CCATATAGGT
3301 GTGATTTTT TCTCCATTT AGCTCCTTA GCTCCTGAAA ATCTCGATAA
CACTAAAAAA AGAGGTAAAAA TCGAAGGAAT CGAGGACTTT TAGAGCTATT
3351 CTCAAAAAAT ACGCCCGGT A GTGATCTTAT TTCATTATGG TGAAAGTTGG
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3401 AACCTCACCC GACGTCTAAT GTGAGTTAGC TCACTCATTA GGCACCCAG
TTGGAGTGGG CTGCAGATT A CACTCAATCG AGTGAGTAAT CCGTGGGGTC
3451 GCTTACACT TTATGCTCC GGCTCGTATG TTGTGTGGAA TTGTGAGCGG
CGAAATGTGA AATACGAAGG CCGAGCATAAC AACACACCTT AACACTCGCC

M13 Reverse primer 100.0%

XbaI

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3501 ATAACAATTT CACACAGGAA ACAGCTATGA CCATGATTAC GAATTCT
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Figure 12

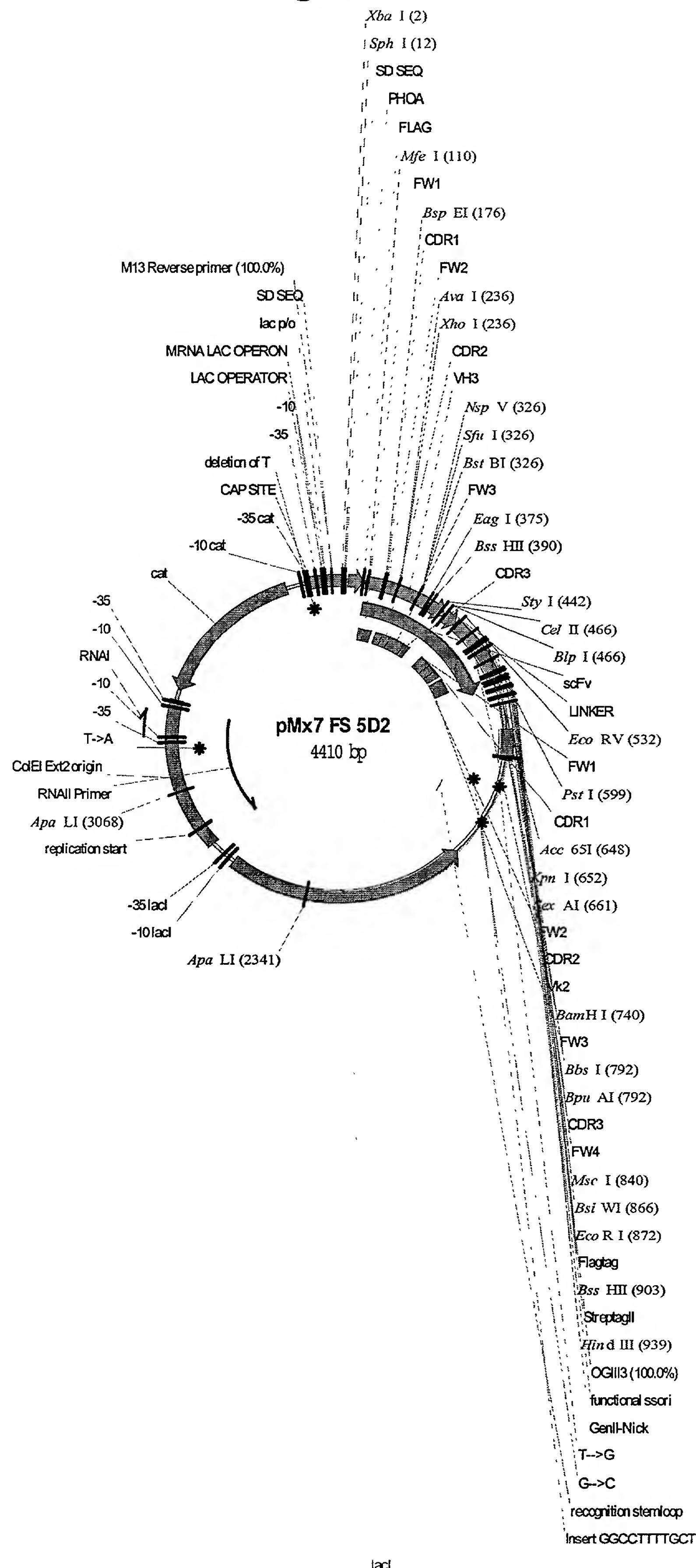


Figure 12 (cont)

XbaI SphI
~~~~~

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51 GGCACTCTTA CCGTTGCTCT TCACCCCTGT TACCAAAGCC GACTACAAAG  
CCGTGAGAAT GGCAACGAGA AGTGGGGACA ATGGTTTCGG CTGATGTTTC

MfeI  
~~~~~

101 ATGAAGTGCA ATTGGTGGAA AGCGGCGGCG GCCTGGTGCA ACCGGGCGGC
TACTTCACGT TAACCACCTT TCGCCGCCGC CGGACCACGT TGGCCCGCCG

BspEI
~~~~~

151 AGCCTGCGTC TGAGCTGCGC GGCCTCCGGA TTTACCTTA GCAGCTATGC  
TCGGACGCAG ACTCGACGCG CCGGAGGCCT AAATGGAAAT CGTCGATAACG

XhoI  
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AvaI
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201 GATGAGCTGG GTGCGCCAAG CCCCTGGAA GGGTCTCGAG TGGGTGAGCG  
CTACTCGACC CACGCGGTTTC GGGGACCCTT CCCAGAGCTC ACCCACTCGC

251 CGATTAGCGG TAGCGGCGGC AGCACCTATT ATGCGGATAG CGTGAAAGGC  
GCTAATCGCC ATCGCCGCCG TCGTGGATAA TACGCCTATC GCACTTCCG

BstBI  
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SfuI
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NspV  
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301 CGTTTACCA TTTCACGTGA TAATTCGAAA AACACCCTGT ATCTGCAAAT
GCAAAATGGT AAAGTGCACT ATTAAGCTTT TTGTGGGACA TAGACGTTA

EagI BssHII
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351 GAACAGCCTG CGTGCAGAAG ATACGGCCGT GTATTATTGC GCGCGTGTAA  
CTTGTGGAC GCACGCCCTTC TATGCCGGCA CATAATAACG CGCGCACAAT

StyI  
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401 AGAAGCATT TTCTCGTAAG AATTGGTTG ATTATTGGGG CCAAGGCACC
TCTTCGTAAA AAGAGCATTG TTAACCAAAC TAATAACCCC GGTTCCGTGG

BlpI

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CelII

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451 CTGGTGACGG TTAGCTCAGC GGGTGGCGGT TCTGGCGCG GTGGGAGCGG
GACCACTGCC AATCGAGTCG CCCACCGCCA AGACCGCCGC CACCCCTCGCC

EcoRV

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501 TGGCGGTGGT TCTGGCGGTG GTGGTTCCGA TATCGTGATG ACCCAGAGCC  
ACCGCCACCA AGACCGCCAC CACCAAGGCT ATAGCACTAC TGGGTCTCGG

PstI

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551 CACTGAGCCT GCCAGTGACT CCGGGCGAGC CTGCGAGCAT TAGCTGCAGA
GTGACTCGGA CGGTCACTGA GGCCCGCTCG GACGCTCGTA ATCGACGTCT

KpnI

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Acc65I

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601 AGCAGCCAAA GCCTGCTGCA TAGCAACGGC TATAACTATC TGGATTGGTA
TCGTCGGTTT CGGACGACGT ATCGTTGCCG ATATTGATAG ACCTAACCAT

KpnI

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Acc65I SexAI

~~ ~~~~~

651 CCTTCAAAAAA CCAGGTCAAA GCCCGCAGCT ATTAATTAT CTGGGCAGCA
GGAAGTTTTT GGTCCAGTTT CGGGCGTCGA TAATTAAATA GACCCGTCGT

BamHI

~~~~~

701 ACCGTGCCAG TGGGGTCCCG GATCGTTTA GCGGCTCTGG ATCCGGCACC  
TGGCACGGTC ACCCCAGGGC CTAGCAAAT CGCCGAGACC TAGGCCGTGG

BpuAI

~~~~~

BbsI

~~~~~

751 GATTTTACCC TGAAAATTAG CCGTGTGGAA GCTGAAGACG TGGGCCTGTA  
CTAAAATGGG ACTTTAATC GGCACACCTT CGACTTCTGC ACCCGCACAT

MscI

~~~~~

801 TTATTGCCAG CAGCATTATA CCACCCGCC GACCTTGGC CAGGGTACGA
AATAACGGTC GTCGTAATAT GGTGGGGCGG CTGGAAACCG GTCCCATGCT

BsiWI EcorI

~~~~~

851 AAGTTGAAAT TAAACGTACG GAATTGACT ATAAAGATGA CGATGACAAA  
TTCAACTTTA ATTTGCATGC CTTAAGCTGA TATTCTACT GCTACTGTTT

BssHII

HindIII

~~~~~

901 GGCGCGCCGT GGAGCCACCC GCAGTTGAA AAATGATAAG CTTGACCTGT
CCGCGCGGCA CCTCGGTGGG CGTCAAACCTT TTTACTATTC GAACTGGACA
OGIII3 100.0%

=====

951 GAAGTGAAAA ATGGCGCAGA TTGTGCGACA TTTTTTTGT CTGCCGTTA
CTTCACTTT TACCGCGTCT AACACGCTGT AAAAAAAACA GACGGCAAAT
OGIII3 100.0%

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1001 ATTAAAGGGG GGGGGGGGCC GGCCTGGGGG GGGGTGTACA TGAAATTGTA
TAATTTCCCC CCCCCCCCCGG CCGGACCCCCC CCCCACATGT ACTTTAACAT

1051 AACGTTAATA TTTTGTAAA ATTGCGTTA AATTTTGTT AAATCAGCTC
TTGCAATTAT AAAACAATT TAAGCGCAAT TTAAAAACAA TTTAGTCGAG

1101 ATTTTTAAC CAATAGGCCG AAATCGGCAA AATCCCTTAT AAATCAAAAG
TAAAAAAATTG GTTATCCGGC TTTAGCCGTT TTAGGGAATA TTTAGTTTC

1151 AATAGACCGA GATAGGGTTG AGTGTGTTTC CAGTTGGAA CAAGAGTCCA
TTATCTGGCT CTATCCCAAC TCACAACAAG GTCAAACCTT GTTCTCAGGT

1201 CTATTAAAGA ACGTGGACTC CAACGTCAA GGGCGAAAAA CCGTCTATCA
GATAATTCT TGCACCTGAG GTTGCAGTTT CCCGCTTTT GGCAGATAGT

1251 GGGCGATGGC CCACTACGAG AACCATCACC CTAATCAAGT TTTTGCGGT
CCCGCTACCG GGTGATGCTC TTGGTAGTGG GATTAGTTCA AAAAACCCCA

1301 CGAGGTGCCG TAAAGCACTA AATCGGAACC CTAAAGGGAG CCCCCGATTT
GCTCCACGGC ATTCGTGAT TTAGCCTTGG GATTCCCTC GGGGGCTAAA

1351 AGAGCTTGAC GGGGAAAGCC GGCGAACGTG GCGAGAAAGG AAGGGAAGAA
TCTCGAACTG CCCCTTCGG CCGCTTGCAC CGCTCTTCC TTCCCTTCTT

1401 AGCGAAAGGA GCAGGGCGCTA GGGCGCTGGC AAGTGTAGCG GTCACGCTGC
TCGCTTCCT CGCCCGCGAT CCCGCGACCG TTCACATCGC CAGTGCACG

1451 GCGTAACCAC CACACCCGCC GCGCTTAATG CGCCGCTACA GGGCGCGTGC
CGCATTGGTG GTGTGGCGG CGCGAATTAC GCAGCGATGT CCCGCGCACG

1501 TAGACTAGTG TTTAAACCGG ACCGGGGGGG GGCTTAAGTG GGCTGCAAAA
ATCTGATCAC AAATTGGCC TGGCCCCCCC CCGAATTAC CCGACGTTT

1551 CAAAACGGCC TCCTGTCAGG AAGCCGCTTT TATCGGGTAG CCTCACTGCC
GTTTGCCGG AGGACAGTCC TTCGGCGAAA ATAGCCCATC GGAGTGACGG

1601 CGCTTCCAG TCGGGAAACC TGTGTCAGG GCTGCATCAG TGAATCGGCC
GCGAAAGGTC AGCCCTTGG ACAGCACGGT CGACGTAGTC ACTTAGCCGG

1651 AACGCGCGGG GAGAGGCGGT TTGCGTATTG GGAGCCAGGG TGGTTTTCT
TTGCGCGCCC CTCTCCGCCA AACGCATAAC CCTCGGTCCC ACCAAAAAGA

1701 TTTCACCAAGT GAGACGGGCA ACAGCTGATT GCCCTTCACC GCCTGGCCCT
AAAGTGGTCA CTCTGCCCGT TGTGACTAA CGGGAAAGTGG CGGACCGGGGA

1751 GAGAGAGTTG CAGCAAGCGG TCCACGCTGG TTTGCCCGAG CAGGCGAAAAA
CTCTCTCAAC GTCGTTGCCA AGGTGCGACC AACCGGGTC GTCCGCTTT

1801 TCCTGTTGA TGGTGGTCAG CGGCAGGATA TAACATGAGC TGTCTCGGT
AGGACAAACT ACCACCAGTC GCCGCCCTAT ATTGTACTCG ACAGGAGCCA

1851 ATCGTCGTAT CCCACTACCG AGATGTCCGC ACCAACGCGC AGCCCGGACT
TAGCAGCATA GGGTGATGGC TCTACAGGCG TGGTTGCGCG TCGGGCCTGA

1901 CGGTAATGGC ACGCATTGCG CCCAGCGCCA TCTGATCGTT GGCAACCAGC
GCCATTACCG TGCATAACGC GGGTCGCGGT AGACTAGCAA CCGTTGGTCG

1951 ATCGCAGTGG GAACGATGCC CTCATTCAAGC ATTGATGG TTTGTTGAAA
TAGCGTCACC CTTGCTACGG GAGTAAGTCG TAAACGTACC AAACAACATT

2001 ACCGGACATG GCACTCCAGT CGCCTTCCCG TTCCGCTATC GGCTGAATT
TGGCCTGTAC CGTGAGGTCA GCGGAAGGGC AAGGCGATAG CCGACTTAAA

2051 GATTGCGAGT GAGATATTAA TGCCAGCCAG CCAGACGCAG ACGCGCCGAG
CTAACGCTCA CTCTATAAAAT ACGGTCGGTC GGTCTGCGTC TGCGCGGCTC

2101 ACAGAACTTA ATGGGCCAGC TAACAGCGCG ATTGCTGGT GGCCAATGC
TGTCTTGAAT TACCCGGTCG ATTGTCGCGC TAAACGACCA CCGGGTTACG

2151 GACCAGATGC TCCACGCCA GTCGCGTACC GTCCCTCATGG GAGAAAATAA
CTGGTCTACG AGGTGCGGGT CAGCGCATGG CAGGAGTACC CTCTTTATT

2201 TACTGTTGAT GGGTGTCTGG TCAGAGACAT CAAGAAATAA CGCCGGAACA
ATGACAACTA CCCACAGACC AGTCTCTGTA GTTCTTTATT GCGGCCTTGT

2251 TTAGTGCAGG CAGCTTCCAC AGCAATAGCA TCCTGGTCAT CCAGCGGATA
AATCACGTCC GTCGAAGGTG TCGTTATCGT AGGACCAGTA GGTCGCCTAT

ApalI

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2301 GTTAATAATC AGCCCACGTG CACGTTGCGC GAGAAGATTG TGCACCGCCG  
CAATTATTAG TCGGGTGACT GTGCAACGCG CTCTTCTAAC ACGTGGCGGC  
  
2351 CTTTACAGGC TTGACGCCG CTTCGTTCTA CCATCGACAC GACCACGCTG  
GAAATGTCCG AAGCTGCGGC GAAGCAAGAT GGTAGCTGTG CTGGTGCAC

2401 GCACCCAGTT GATCGCGCG AGATTTAAC CCGCGACAA TTTGCGACGG  
CGTGGGTCAA CTAGCCGCGC TCTAAATTAG CGGCGCTGTT AAACGCTGCC  
2451 CGCGTGCAGG GCCAGACTGG AGGTGGCAAC GCCAATCAGC AACGACTGTT  
GCGCACGTCC CGGTCTGACC TCCACCGTTG CGGTTAGTCG TTGCTGACAA  
2501 TGCCCCAG TTGTTGTGCC ACGCGGTTAG GAATGTAATT CAGCTCCGCC  
ACGGGCGGTC AACAACACGG TGCGCCAATC CTTACATTAA GTCGAGGCCG  
2551 ATCGCCGCTT CCACTTTTC CCGCGTTTC GCAGAAACGT GGCTGGCCTG  
TAGCGCGAA GGTGAAAAAG GGCGCAAAAG CGTCTTGCA CCGACCGGAC  
2601 GTTCACCACG CGGGAAACGG TCTGATAAGA GACACCGCA TACTCTGCGA  
CAAGTGGTGC GCCCTTGCC AGACTATTCT CTGTGGCCGT ATGAGACGCT  
2651 CATCGTATAA CGTTACTGGT TTCACATTCA CCACCCCTGAA TTGACTCTCT  
GTAGCATATT GCAATGACCA AAGTGTAAAGT GGTGGGACTT AACTGAGAGA  
2701 TCCGGGCGCT ATCATGCCAT ACCCGAAAG GTTTGCGCC ATTGATGCT  
AGGCCCGCGA TAGTACGGTA TGGCGCTTTC CAAAACGCCG TAAGCTACGA  
2751 AGCCATGTGA GCAAAAGGCC AGCAAAAGGC CAGGAACCGT AAAAAGGCCG  
TCGGTACACT CGTTTCCGG TCGTTTCCG GTCCTGGCA TTTTCCGGC  
2801 CGTTGCTGGC GTTTTCCAT AGGCTCCGCC CCCCTGACGA GCATCACAAA  
GCAACGACCG CAAAAAGGTA TCCGAGGCCG GGGGACTGCT CGTAGTGT  
2851 AATCGACGCT CAAGTCAGAG GTGGCGAAAC CCGACAGGAC TATAAAGATA  
TTAGCTGCGA GTTCAGTCTC CACCGCTTG GGCTGTCCTG ATATTCTAT  
2901 CCAGGCGTTT CCCCCCTGGAA GCTCCCTCGT GCGCTCTCCT GTTCCGACCC  
GGTCCGAAA GGGGGACCTT CGAGGGAGCA CGCGAGAGGA CAAGGCTGGG  
2951 TGCCGCTTAC CGGATACCTG TCCGCCTTTC TCCCTCGGG AAGCGTGGCG  
ACGGCGAATG GCCTATGGAC AGGCGAAAG AGGGAAGCCC TTGCAACCGC  
3001 CTTTCTCATA GCTCACGCTG TAGGTATCTC AGTCGGTGT AGGTCGTTG  
GAAAGAGTAT CGAGTGCAC ATCCATAGAG TCAAGCCACA TCCAGCAAGC

ApaLI

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3051 CTCCAAGCTG GGCTGTGTGC ACGAACCCCC CGTTCAGCCC GACCGCTGCG
GAGGTTCGAC CCGACACACG TGCTTGGGG GCAAGTCGGG CTGGCGACGC
3101 CCTTATCCGG TAACTATCGT CTTGAGTCCA ACCCGGTAAG ACACGACTTA
GGAATAGGCC ATTGATAGCA GAACTCAGGT TGGGCCATTC TGTGCTGAAT
3151 TCGCCACTGG CAGCAGCCAC TGGTAACAGG ATTAGCAGAG CGAGGTATGT
AGCGGTGACC GTCGTCGGTG ACCATTGTCC TAATCGTCTC GCTCCATACA
3201 AGGCGGTGCT ACAGAGTTCT TGAAGTGGTG GCCTAACTAC GGCTACACTA
TCCGCCACGA TGTCTCAAGA ACTTCACCAC CGGATTGATG CCGATGTGAT
3251 GAAGAACAGT ATTTGGTATC TGCGCTCTGC TGTAGCCAGT TACCTTCGGA
CTTCTTGCA TAAACCATAG ACGCGAGACG ACATCGGTCA ATGGAAGCCT

3301 AAAAGAGTTG GTAGCTCTTG ATCCGGCAAA CAAACCACCG CTGGTAGCGG
TTTTCTCAAC CATCGAGAAC TAGGCCGTT GTTTGGTGGC GACCATCGCC

3351 TGGTTTTTT GTTGCAAGC AGCAGATTAC GCGCAGAAAA AAAGGATCTC
ACCAAAAAAA CAAACGTTCG TCGTCTAATG CGCGTCTTT TTTCTAGAG

3401 AAGAAGATCC TTTGATCTTT TCTACGGGGT CTGACGCTCA GTGGAACGAA
TTCTTCTAGG AAACTAGAAA AGATGCCCA GACTGCGAGT CACCTTGCTT

3451 AACTCACGTT AAGGGATTG GGTCAAGATCT AGCACCAAGGC GTTTAAGGGC
TTGAGTGCAA TTCCCTAAAAA CCAGTCTAGA TCGTGGTCCG CAAATTCCCG

3501 ACCAATAACT GCCTTAAAAA AATTACGCC CGCCCTGCCA CTCATCGCAG
TGGTTATTGA CGGAATTTTT TTAATGCGGG GCGGGACGGT GAGTAGCGTC

3551 TACTGTTGTA ATTCATTAAG CATTCTGCCG ACATGGAAGC CATCACAAAC
ATGACAACAT TAAGTAATTG GTAAGACGGC TGTACCTTCG GTAGTGTGG

3601 GGCATGATGA ACCTGAATCG CCAGCGGCAT CAGCACCTTG TCGCCTTGCG
CCGTACTACT TGGACTTAGC GGTGCCGTA GTCGTGGAAC AGCGGAACGC

3651 TATAATATTG GCCCATAGTG AAAACGGGGG CGAAGAAGTT GTCCATATTG
ATATTATAAA CGGGTATCAC TTTGCCCGG GCTTCTTCAA CAGGTATAAC

3701 GCTACGTTA AATCAAAACT GGTGAAACTC ACCCAGGGAT TGGCTGAGAC
CGATGCAAAT TTAGTTTGA CCACTTGAG TGGGTCCCTA ACCGACTCTG

3751 GAAAAACATA TTCTCAATAA ACCCTTAGG GAAATAGGCC AGGTTTCAC
CTTTTGAT AAGAGTTATT TGGGAAATCC CTTTATCCGG TCCAAAAGTG

3801 CGTAACACGC CACATCTTGC GAATATATGT GTAGAAACTG CGGGAAATCG
GCATTGTGCG GTGTAGAACG CTTATATACA CATCTTGAC GGCCTTAGC

3851 TCGTGGTATT CACTCCAGAG CGATGAAAAC GTTCAGTTT GCTCATGGAA
AGCACCATAA GTGAGGTCTC GCTACTTTG CAAAGTCAA CGAGTACCTT

3901 AACGGTGTAA CAAGGGTGAA CACTATCCC TATCACCAGC TCACCGTCTT
TTGCCACATT GTTCCCACTT GTGATAGGGT ATAGTGGTCA AGTGGCAGAA

3951 TCATTGCCAT ACGGAACCTC GGGTGAGCAT TCATCAGGCG GGCAAGAATG
AGTAACGGTA TGCCTTGAGG CCCACTCGTA AGTAGTCCGC CCGTTCTTAC

4001 TGAATAAAGG CCGGATAAAA CTTGTGCTTA TTTTCTTTA CGGTCTTAA
ACTTATTTCC GGCCTATTAA GAACACGAAT AAAAAGAAAT GCCAGAAATT

4051 AAAGGCCGTA ATATCCAGCT GAACGGTCTG GTTATAGGTA CATTGAGCAA
TTTCCGGCAT TATAGGTCTA CTTGCCAGAC CAATATCCAT GTAACTCGTT

4101 CTGACTGAAA TGCCTCAAAA TGTTCTTTAC GATGCCATTG GGATATATCA
GACTGACTTT ACGGAGTTT ACAAGAAATG CTACGGTAAC CCTATATAGT

4151 ACGGTGGTAT ATCCAGTGAT TTTTTCTCC ATTTAGCTT CCTTAGCTCC
TGCCACCATA TAGGTCACTA AAAAAAGAGG TAAAATCGAA GGAATCGAGG

4201 TGAAAATCTC GATAACTCAA AAAATACGCC CGGTAGTGAT CTTATTCAT
ACTTTAGAG CTATTGAGTT TTTTATGCAGG GCCATCACTA GAATAAAGTA

4251 TATGGTGAAA GTTGGAACCT CACCCGACGT CTAATGTGAG TTAGCTCACT
ATACCACCTT CAACCTTGGA GTGGGCTGCA GATTACACTC AATCGAGTGA

4301 CATTAGGCAC CCCAGGCTTT ACACITATG CTTCCGGCTC GTATGTTGTG
GTAATCCGTG GGGTCCGAAA TGTGAAATAC GAAGGCCGAG CATAAACAC

M13 Reverse primer 100.0%

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4351 TGGAATTGTG AGCGGATAAC AATTCACAC AGGAAACAGC TATGACCATG
ACCTAACAC TCGCCTATTG TTAAAGTGTG TCCTTGTG ATACTGGTAC

4401 ATTACGAATT
TAATGCTTAA

Figure 13

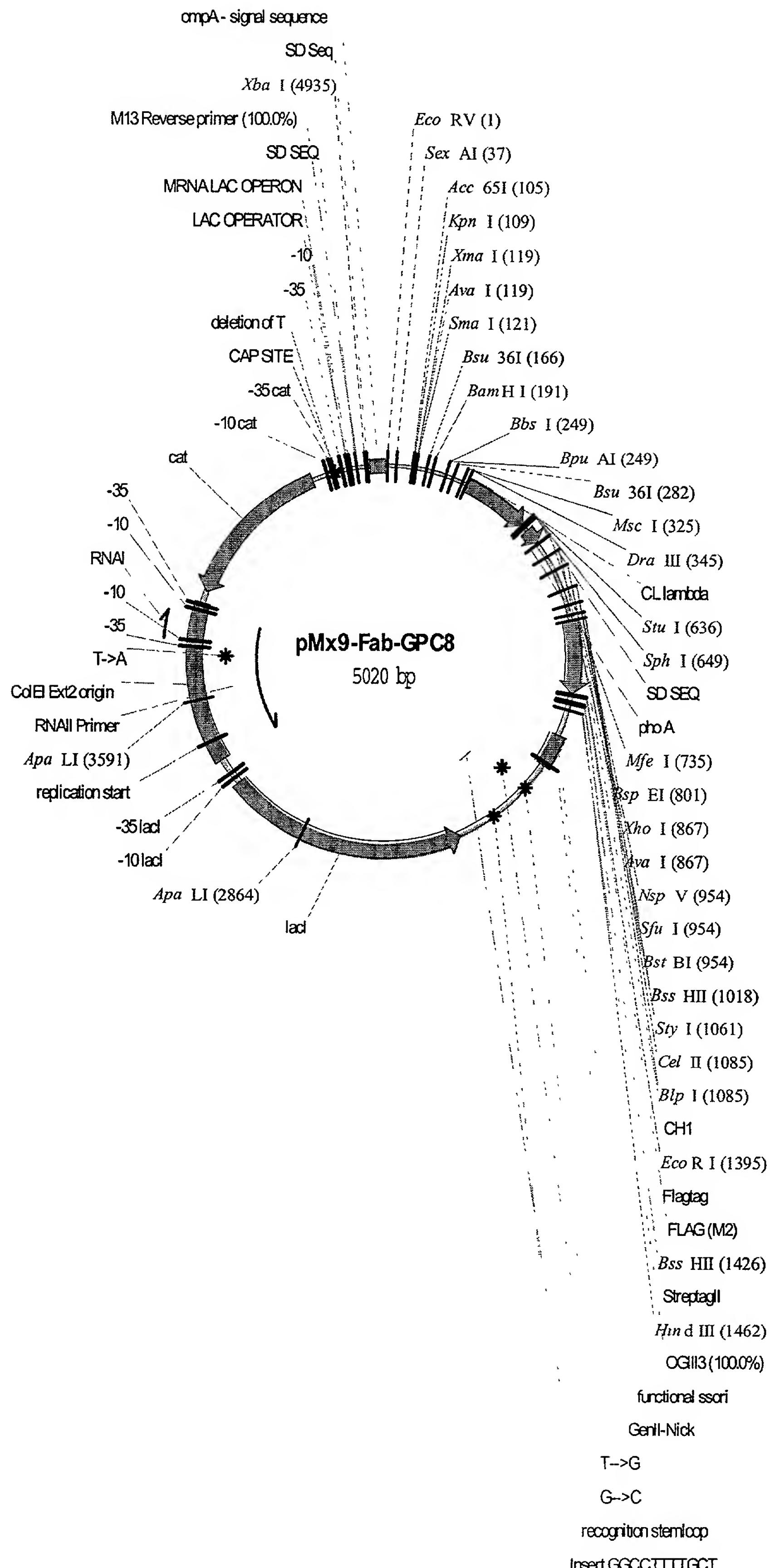


Figure 13 (cont)

	EcoRV		SexAI		
	~~~		~~~~~		
1	ATCGTGCTGA	CCCAGCCGCC	TTCAGTGAGT	GGCGCACCAG	GTCAGCGTGT
	TAGCACGACT	GGGTCGGCGG	AAGTCACTCA	CCGCGTGGTC	CAGTCGCACA
51	GACCATCTCG	TGTAGCGGCA	GCAGCAGCAA	CATTGGCAGC	AACTATGTGA
	CTGGTAGAGC	ACATCGCCGT	CGTCGTCGTT	GTAACCGTCG	TTGATAACACT
	XmaI				
	~~~~~				
	KpnI	SmaI			
	~~~~~	~~~~~			
	Acc65I	AvaI			
	~~~~~	~~~~~			
101	GCTGGTACCA	GCAGTTGCC	GGGACGGCGC	CGAAACTGCT	GATTTATGAT
	CGACCATGGT	CGTCAACGGG	CCCTGCCGCG	GCTTGACGA	CTAAATACTA
	Bsu36I		BamHI		
	~~~~~		~~~~~		
151	AACAACCAGC	GTCCCTCAGG	CGTGCCGGAT	CGTTTAGCG	GATCCAAAAG
	TTGTTGGTCG	CAGGGAGTCC	GCACGGCCTA	GCAAAATCGC	CTAGGTTTC
	BpuAI				
	~~~~~				
	BbsI				
	~~~~~				
201	CGGCACCAGC	GCGAGCCTTG	CGATTACGGG	CCTGCAAAGC	GAAGACGAAG
	GCCGTGGTCG	CGCTCGGAAC	GCTAATGCC	GGACGTTTCG	CTTCTGCTTC
	Bsu36I				
	~~~~~				
251	CGGATTATTA	TTGCCAGAGC	TATGACATGC	CTCAGGCTGT	GTTGGCGGC
	GCCTAATAAT	AACGGTCTCG	ATACTGTACG	GAGTCCGACA	CAAACCGCCG
	MscI		DraIII		
	~~~~~		~~~~~		
301	GGCACGAAGT	TTAACCGTTC	TTGGCCAGCC	GAAAGCCGCA	CCGAGTGTGA
	CCGTGCTTCA	AATTGGCAAG	AACCGGTCGG	CTTCGGCGT	GGCTCACACT
351	CGCTGTTCC	GCCGAGCAGC	GAAGAATTGC	AGGCGAACAA	AGCGACCCTG
	GCGACAAAGG	CGGCTCGTCG	CTTCTTAACG	TCCGCTTGT	TCGCTGGGAC
401	GTGTGCCTGA	TTAGCGACTT	TTATCCGGGA	GCCGTGACAG	TGGCCTGGAA
	CACACGGACT	AATCGCTGAA	AATAGGCCCT	CGGCACTGTC	ACCGGACCTT
451	GGCAGATAGC	AGCCCCGTCA	AGGCGGGAGT	GGAGACCACC	ACACCCTCCA
	CCGTCTATCG	TCGGGGCAGT	TCCGCCCTCA	CCTCTGGTGG	TGTGGGAGGT
501	AACAAAGCAA	CAACAAGTAC	GCGGCCAGCA	GCTATCTGAG	CCTGACGCCCT
	TTGTTTCGTT	GTTGTTCATG	CGCCGGTCGT	CGATAGACTC	GGACTGCGGA
551	GAGCAGTGGA	AGTCCCACAG	AAGCTACAGC	TGCCAGGTCA	CGCATGAGGG
	CTCGTCACCT	TCAGGGTGTG	TTCGATGTG	ACGGTCCAGT	GCGTACTCCC

601 GAGCACCGTG GAAAAAACCG TTGCGCCGAC TGAGGCCTGA TAAGCATGCG  
CTCGTGGCAC CTTTTTGGC AACCGGGCTG ACTCCGGACT ATTCTGTACGC

651 TAGGAGAAAA TAAAATGAAA CAAAGCACTA TTGCACTGGC ACTCTTACCG  
ATCCTCTTT ATTTTACTTT GTTCGTGAT AACGTGACCG TGAGAATGGC

MfeI

701 TTGCTCTTCA CCCCTGTTAC CAAAGCCCAG GTGCAATTGA AAGAAAGCGG  
AACGAGAAGT GGGGACAATG GTTCGGGTC CACGTTAACT TTCTTCGCC

BspEI

751 CCCGGCCCTG GTGAAACCGA CCCAAACCCCT GACCCTGACC TGTACCTTT  
GGGCCGGGAC CACTTGGCT GGGTTGGGA CTGGGACTGG ACATGGAAAA

BspEI

801 CCGGATTAG CCTGTCCACG TCTGGCGTTG GCGTGGGCTG GATTGCCAG  
GCCCTAAATC GGACAGGTGC AGACCGAAC CGCACCCGAC CTAAGCGGTC

XbaI

851 CCGCCTGGGA AAGCCCTCGA GTGGCTGGCT CTGATTGATT GGGATGATGA  
GGCGGACCCCT TTCGGGAGCT CACCGACCGA GACTAACTAA CCCTACTACT

901 TAAGTATTAT AGCACCAGCC TGAAAACGCG TCTGACCATT AGCAAAGATA  
ATTCTATAATA TCGTGGTCGG ACTTTGCAC AGACTGGTAA TCGTTCTAT

BstBI

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SfuI

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NspV

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951 CTTCGAAAAA TCAGGTGGTG CTGACTATGA CCAACATGGA CCCGGTGGAT
GAAGCTTTT AGTCCACCCAC GACTGATACT GGTTGTACCT GGGCCACCTA

BssHII

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1001 ACGGCCACCT ATTATTGCGC GCGTTCTCCT CGTTATCGTG GTGCTTTGA  
TGCCGGTGGGA TAATAACGCG CGCAAGAGGA GCAATAGCAC CACGAAACT

BpuI

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StyI

CelII

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1051 TTATTGGGGC CAAGGCACCC TGGTGACGGT TAGCTCAGCG TCGACCAAAG  
AATAACCCCG GTTCCGTGGG ACCACTGCCA ATCGAGTCGC AGCTGGTTTC

1101 GTCCAAGCGT GTTCCGCTG GCTCCGAGCA GCAAAAGCAC CAGCGGGCGC  
CAGGTTCGCA CAAAGGGCAC CGAGGCTCGT CGTTTCGTG GTCGCCGCCG

1151 ACGGCTGCC C TGGGCTGCCT GGTTAAAGAT TATTTCACCGG AACCAAGTCAC

TGCCGACGGG ACCCGACGGA CCAATTCTA ATAAAGGGCC TTGGTCAGTG

1201 CGTGAGCTGG AACAGCGGGG CGCTGACCAG CGGCGTGCAT ACCTTCGG  
GCACTCGACC TTGTCGCCCG GCGACTGGTC GCCGCACGTA TGGAAAGGCC

1251 CGGTGCTGCA AAGCAGCGGC CTGTATAGCC TGAGCAGCGT TGTGACCGTG  
GCCACGACGT TTCGTCGCCG GACATATCGG ACTCGTCGCA ACACTGGCAC

1301 CCGAGCAGCA GCTTAGGCAC TCAGACCTAT ATTGCAACG TGAACCATAA  
GGCTCGTCGT CGAATCCGTG AGTCTGGATA TAAACGTTGC ACTTGGTATT

EcoRI  
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1351 ACCGAGCAAC ACCAAAGTGG ATAAAAAAAGT GGAACCGAAA AGCGAATTG
TGGCTCGTTG TGGTTTCACC TATTTTTCA CCTTGGCTTT TCGCTTAAGC

BssHII
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1401 ACTATAAAGA TGACGATGAC AAAGGCGCGC CGTGGAGCCA CCCGCAGTT  
TGATATTCT ACTGCTACTG TTTCCGCGCG GCACCTCGGT GGGCGTCAAA

HindIII  
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1451 GAAAAATGAT AAGCTTGACC TGTGAAGTGA AAAATGGCGC AGATTGTGCG
CTTTTACTA TTCGAACTGG ACACCTCACT TTTACCGCG TCTAACACGC
OGIII3 100.0%
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1501 ACATTTTTT TGTCTGCCGT TTAATTAAAG GGGGGGGGGG GCCGGCCTGG
TGTAAAAAAA ACAGACGGCA AATTAATTTC CCCCCCCCCC CGGCCGGACC

1551 GGGGGGGTGT ACATGAAATT GTAAACGTTA ATATTTGTT AAAATTGCG
CCCCCCCACA TGTACTTTAA CATTGCAAT TATAAAACAA TTTAAGCGC

1601 TTAAATTTT GTTAAATCAG CTCATTTTT AACCAATAGG CCGAAATCGG
AATTAAAAAA CAATTTAGTC GAGTAAAAAA TTGGTTATCC GGCTTAGCC

1651 CAAAATCCCT TATAAATCAA AAGAATAGAC CGAGATAGGG TTGAGTGTG
GTTTAGGGA ATATTTAGTT TTCTTATCTG GCTCTATCCC AACTCACAAAC

1701 TTCCAGTTG GAACAAGAGT CCACTATTAA AGAACGTGGA CTCCAACGTC
AAGGTCAAAC CTTGTTCTCA GGTGATAATT TCTTGCACCT GAGGTTGCAG

1751 AAAGGGCGAA AAACCGTCTA TCAGGGCGAT GGCCCCACTAC GAGAACCATC
TTTCCCGCTT TTTGGCAGAT AGTCCCGCTA CCGGGTGATG CTCTTGGTAG

1801 ACCCTAAATCA AGTTTTTGG GGTGAGGTG CCGTAAAGCA CTAAATCGGA
TGGGATTAGT TCAAAAAACC CCAGCTCCAC GGCATTTCGT GATTTAGCCT

1851 ACCCTAAAGG GAGCCCCCGA TTTAGAGCTT GACGGGGAAA GCCGGCGAAC
TGGGATTTC CTCGGGGGCT AAATCTCGAA CTGCCCTTT CGGCCGCTTG

1901 GTGGCGAGAA AGGAAGGGAA GAAAGCGAAA GGAGCGGGCG CTAGGGCGCT
CACCGCTCTT TCCTTCCCTT CTTTCGCTTT CCTCGCCCGC GATCCCGCGA

1951 GGCAAGTGTGTA GCGGTACCGC TGCGCGTAAC CACCACACCC GCCGCGCTTA
CCGTTCACAT CGCCAGTGCAC ACGCGCATTG GTGGTGTGGG CGGCGCGAAT

2001 ATGCGCCGCT ACAGGGCGCG TGCTAGACTA GTGTTAACCG CGGACCGGGG
TACGCGCGA TGTCCCGCGC ACGATCTGAT CACAAATTG GCCTGGCCCC
2051 GGGGGCTTAA GTGGGCTGCA AAACAAAACG GCCTCCTGTC AGGAAGCCGC
CCCCCGAATT CACCCGACGT TTTGTTTGC CGGAGGACAG TCCTTCGGCG
2101 TTTTATCGGG TAGCCTCACT GCCCGCTTTC CAGTCGGGAA ACCTGTCGTG
AAAATAGCCC ATCGGAGTGA CGGGCGAAAG GTCAGCCCTT TGGACAGCAC
2151 CCAGCTGCAT CAGTGAATCG GCCAACGCGC GGGGAGAGGC GTTTGCGTA
GGTCGACGTA GTCACTTAGC CGGTTGCGCG CCCCTCTCCG CCAAACGCAT
2201 TTGGGAGCCA GGGTGGTTTT TCTTTTCAAC AGTGAGACGG GCAACAGCTG
AACCCCTCGGT CCCACCAAAA AGAAAAGTGG TCACTCTGCC CGTTGTCGAC
2251 ATTGCCCTTC ACCGCCTGGC CCTGAGAGAG TTGCAGCAAG CGGTCCACGC
TAACGGGAAG TGGCGGACCG GGACTCTCTC AACGTCGTTT GCCAGGTGCG
2301 TGTTTGCCTT CAGCAGGCAG AAATCCTGTT TGATGGTGGT CAGCGGCGGG
ACCAAACGGG GTCGTCCGCT TTTAGGACAA ACTACCACCA GTCGCCGCC
2351 ATATAACATG AGCTGTCCTC GGTATCGTCG TATCCCACCA CCGAGATGTC
TATATTGTAC TCGACAGGAG CCATAGCAGC ATAGGGTGAT GGCTCTACAG
2401 CGCACCAACG CGCAGCCCGG ACTCGGTAAT GGCACGCATT GCGCCCAGCG
GCGTGGTTGC GCGTCGGGCC TGAGCCATTA CCGTGCCTAA CGCGGGTCGC
2451 CCATCTGATC GTTGGCAACC AGCATCGCAG TGGGAACGAT GCCCTCATTC
GGTAGACTAG CAACC GTTGG CAACCGTTGG TCGTAGCGTC ACCCTTGCTA CGGGAGTAAG
2501 AGCATTGCA TGGTTGTTG AAAACCGGAC ATGGCACTCC AGTCGCCCTTC
TCGTAAACGT ACCAAACAAAC TTTTGGCCTG TACCGTGAGG TCAGCGGAAG
2551 CCGTCCGCT ATCGGCTGAA TTTGATTGCG AGTGAGATAT TTATGCCAGC
GGCAAGGCAGA TAGCCGACTT AAAACTAACGC TCACTCTATA AATACGGTCG
2601 CAGCCAGACG CAGACGCGCC GAGACAGAAC TTAATGGGCC AGCTAACAGC
GTCGGTCTGC GTCTGCGCGG CTCTGTCTTG AATTACCCGG TCGATTGTCG
2651 GCGATTGCT GGTGGCCCAA TGCGACCAGA TGCTCCACGC CCAGTCGCGT
CGCTAAACGA CCACCGGGTT ACGCTGGTCT ACGAGGTGCG GGTCAAGCGCA
2701 ACCGTCCCTCA TGGGAGAAAA TAATACTGTT GATGGGTGTC TGGTCAGAGA
TGGCAGGAGT ACCCTCTTT ATTATGACAA CTACCCACAG ACCAGTCTCT
2751 CATCAAGAAA TAACGCCGGA ACATTAGTGC AGGCAGCTTC CACAGCAATA
GTAGTTCTT ATTGCGGCCT TGTAATCACG TCCGTCGAAG GTGTCGTTAT
2801 GCATCCTGGT CATCCAGCGG ATAGTTAATA ATCAGCCAC TGACACGTTG
CGTAGGACCA GTAGGTCGCC TATCAATTAT TAGTCGGGTG ACTGTGCAAC

ApalI

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2851 CGCGAGAAGA TTGTGCACCG CCGCTTTACA GGCTCGACG CCGCTTCGTT  
GCGCTCTTCT AACACGTGGC GGCGAAATGT CCGAAGCTGC GGCAGAAC

2901 CTACCATCGA CACGACCACG CTGGCACCCA GTTGATCGGC GCGAGATT  
GATGGTAGCT GTGCTGGTGC GACCGTGGGT CAACTAGCCG CGCTCTAAAT  
2951 ATCGCCGCGA CAATTGCGA CGGCGCGTGC AGGGCCAGAC TGGAGGTGGC  
TAGCGGGCGCT GTTAAACGCT GCCGCGCACG TCCCGGTCTG ACCTCCACCG  
3001 AACGCCAATC AGCAACGACT GTTGCCCCGC CAGTTGTTGT GCCACGCGGT  
TTGCGGTTAG TCGTTGCTGA CAAACGGGCG GTCAACAAACA CGGTGCGCCA  
3051 TAGGAATGTA ATTCAAGCTCC GCCATCGCCG CTTCCACTTT TTCCCGCGTT  
ATCCTTACAT TAAGTCGAGG CGGTAGCGGC GAAGGTGAAA AAGGGCGCAA  
3101 TTTCGAGAAA CGTGGCTGGC CTGGTTCACCC ACGCGGGAAA CGGTCTGATA  
AAGCGTCTT GCACCGACCG GACCAAGTGG TGCGCCCTT GCCAGACTAT  
3151 AGAGACACCG GCATACTCTG CGACATCGTA TAACGTTACT GGTTTCACAT  
TCTCTGTGGC CGTATGAGAC GCTGTAGCAT ATTGCAATGA CCAAAGTGT  
3201 TCACCACCCCT GAATTGACTC TCTTCCGGGC GCTATCATGC CATAACCGCA  
AGTGGTGGGA CTTAACTGAG AGAAGGCCCG CGATAGTACG GTATGGCGCT  
3251 AAGGTTTGC GCCATTGAT GCTAGCCATG TGAGCAAAAG GCCAGCAAAA  
TTCCAAAACG CGGTAAGCTA CGATCGGTAC ACTCGTTTC CGGTCGTTTT  
3301 GGCCAGGAAC CGTAAAAGG CCGCGTTGCT GGCCTTTTC CATAGGCTCC  
CCGGTCCTTG GCATTTTCC GGCGCAACGA CCGCAAAAG GTATCCGAGG  
3351 GCCCCCCCTGA CGAGCATCAC AAAAATCGAC GCTCAAGTCA GAGGTGGCGA  
CGGGGGGACT GCTCGTAGTG TTTTAGCTG CGAGTTCACT CTCCACCGCT  
3401 AACCCGACAG GACTATAAAG ATACCAGGCG TTTCCCCCTG GAAGCTCCCT  
TTGGGCTGTC CTGATATTTC TATGGTCCGC AAAGGGGGAC CTTCGAGGGA  
3451 CGTGCCTCT CCTGTTCCGA CCCTGCCGCT TACCGGATAC CTGTCCGCCT  
GCACCGAGA GGACAAGGCT GGGACGGCGA ATGGCCTATG GACAGGCGGA  
3501 TTCTCCCTTC GGGAAAGCGTG GCGCTTTCTC ATAGCTCACG CTGTAGGTAT  
AAGAGGGAAG CCCTCGCAC CGCGAAAGAG TATCGAGTGC GACATCCATA

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3551 CTCAGTTCGG TGTAGGTCGT TCGCTCCAAG CTGGGCTGTG TGCACGAACC
GAGTCAAGCC ACATCCAGCA AGCGAGGTTG GACCCGACAC ACGTGCTTGG
3601 CCCCCTTCAG CCCGACCGCT GCGCCTTATC CGGTAACTAT CGTCTTGAGT
GGGGCAAGTC GGGCTGGCGA CGCGGAATAG GCCATTGATA GCAGAACTCA
3651 CCAACCCGGT AAGACACGAC TTATGCCAC TGGCAGCAGC CACTGGTAAC
GGTTGGGCCA TTCTGTGCTG AATAGCGGTG ACCGTCGTCG GTGACCATTG
3701 AGGATTAGCA GAGCGAGGTA TGTAGGCGGT GCTACAGAGT TCTTGAAGTG
TCCTAATCGT CTCGCTCCAT ACATCCGCCA CGATGTCTCA AGAACTTCAC
3751 GTGGCCTAAC TACGGCTACA CTAGAAGAAC AGTATTGGT ATCTGCGCTC
CACCGGATTG ATGCCGATGT GATCTTCTTG TCATAAACCA TAGACGCGAG
3801 TGCTGTAGCC AGTTACCTTC GGAAAAAGAG TTGGTAGCTC TTGATCCGGC

ACGACATCGG TCAATGGAAG CCTTTTCTC AACCATCGAG AACTAGGCCG

3851 AAACAAACCA CCGCTGGTAG CGGTGGTTT TTTGTTGCA AGCAGCAGAT
TTTGTGGT GGCGACCATC GCCACCAAAA AAACAAACGT TCGTCGTCTA

3901 TACGCGCAGA AAAAAAGGAT CTCAAGAAGA TCCTTGATC TTTTCTACGG
ATGCGCGTCT TTTTTCTA GAGTTCTTCT AGGAAACTAG AAAAGATGCC

3951 GGTCTGACGC TCAGTGGAAC GAAAACTCAC GTTAAGGGAT TTTGGTCAGA
CCAGACTGCG AGTCACCTTG CTTTGAGTG CAATTCCCTA AAACCAGTCT

4001 TCTAGCACCA GGC GTTAAAG GGCACCAATA ACTGCCTTAA AAAAAATTACG
AGATCGTGGT CCGCAAATTC CCGTGGTTAT TGACGGAATT TTTTAATGC

4051 CCCC GCCCTG CCACTCATCG CAGTA CTTGTT GTAATT CATT AAGCATTCTG
GGGGCGGGAC GGTGAGTAGC GTCATGACAA CATTAAGTAA TTCGTAAGAC

4101 CCGACATGGA AGCCATCACA AACGGCATGA TGAACCTGAA TCGCCAGCGG
GGCTGTACCT TCGGTAGTGT TTGCCGTACT ACTTGGACTT AGCGGTCGCC

4151 CATCAGCACC TTGTCGCCTT GCGTATAATA TTTGCCATA GTGAAAACGG
GTAGTCGTGG AACAGCGGAA CGCATATTAT AAACGGGTAT CACTTTGCC

4201 GGGCGAAGAA GTTGTCCATA TTGGCTACGT TTAAATCAA ACTGGTGAAA
CCCGCTTCTT CAACAGGTAT AACCGATGCA AATTTAGTT TGACCACTTT

4251 CTCACCCAGG GATTGGCTGA GACGAAAAAC ATATTCTCAA TAAACCCTTT
GAGTGGGTCC CTAACCGACT CTGCTTTTG TATAAGAGTT ATTTGGGAAA

4301 AGGGAAATAG GCCAGGTTT CACCGTAACA CGCCACATCT TCGAATATA
TCCCTTATC CGGTCCAAAAA GTGGCATTGT GCGGTGTAGA ACGCTTATAT

4351 TGTGTAGAAA CTGCCGGAAA TCGTCGTGGT ATTCACTCCA GAGCGATGAA
ACACATCTT GACGGCCTT AGCAGCACCA TAAGTGAGGT CTCGCTACTT

4401 AACGTTTCAG TTTGCTCATG GAAAACGGTG TAACAAGGGT GAACACTATC
TTGCAAAGTC AAACGAGTAC CTTTGCCAC ATTGTTCCA CTTGTGATAG

4451 CCATATCACC AGCTCACCGT CTTTCATTGC CATA CGGAAC TCCGGGTGAG
GGTATAGTGG TCGAGTGGCA GAAAGTAACG GTATGCCTTG AGGCCCACTC

4501 CATT CATCAG GCGGGCAAGA ATGTGAATAA AGGCCGGATA AAAC TTGTGC
GTAAGTAGTC CGCCCGTTCT TACACTTATT TCCGGCCTAT TTTGAACACG

4551 TTATTTTCT TTACGGTCTT TAAAAAGGCC GTAATATCCA GCTGAACGGT
AATAAAAAGA AATGCCAGAA ATTTTCCGG CATTATAGGT CGACTTGCCA

4601 CTGGTTATAG GTACATTGAG CAACTGACTG AAATGCCTCA AAATGTTCTT
GACCAATATC CATGTAACTC GTTGA CTTGACTGAC TTTACGGAGT TTTACAAGAA

4651 TACGATGCCA TTGGGATATA TCAACGGTGG TATATCCAGT GATTTTTTC
ATGCTACGGT AACCCCTATAT AGTTGCCACC ATATAGGTCA CTAAAAAAAG

4701 TCCATTTAG CTTCCTTAGC TCCTGAAAAT CTCGATAACT CAAAAAATAC
AGGTAAAATC GAAGGAATCG AGGACTTTA GAGCTATTGA GTTTTTATG

4751 GCCCGGTAGT GATCTTATTT CATTATGGTG AAAGTTGGAA CCTCACCGA

CGGGCCATCA CTAGAATAAA GTAATACCAC TTTCAACCTT GGAGTGGGCT

4801 CGTCTAATGT GAGTTAGCTC ACTCATTAGG CACCCCAGGC TTTACACTT
GCAGATTACA CTCAATCGAG TGAGTAATCC GTGGGGTCCG AAATGTGAAA

4851 ATGCTTCCGG CTCGTATGTT GTGTGGAATT GTGAGCGGAT AACAAATTCA
TACGAAGGCC GAGCATAACAA CACACCTAA CACTCGCCTA TTGTTAAAGT

M13 Reverse primer 100.0%

XbaI

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4901 CACAGGAAAC AGCTATGACC ATGATTACGA ATTTCTAGAT AACGAGGGCA  
GTGTCCTTTG TCGATACTGG TACTAATGCT TAAAGATCTA TTGCTCCGT

4951 AAAAATGAAA AAGACAGCTA TCGCGATTGC AGTGGCACTG GCTGGTTCG  
TTTTTACTTT TTCTGTGAT AGCGCTAACG TCACCGTGAC CGACCAAAGC

EcoRV

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5001 CTACCGTAGC GCAGGCCGAT
GATGGCATCG CGTCCGGCTA

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Figure 14

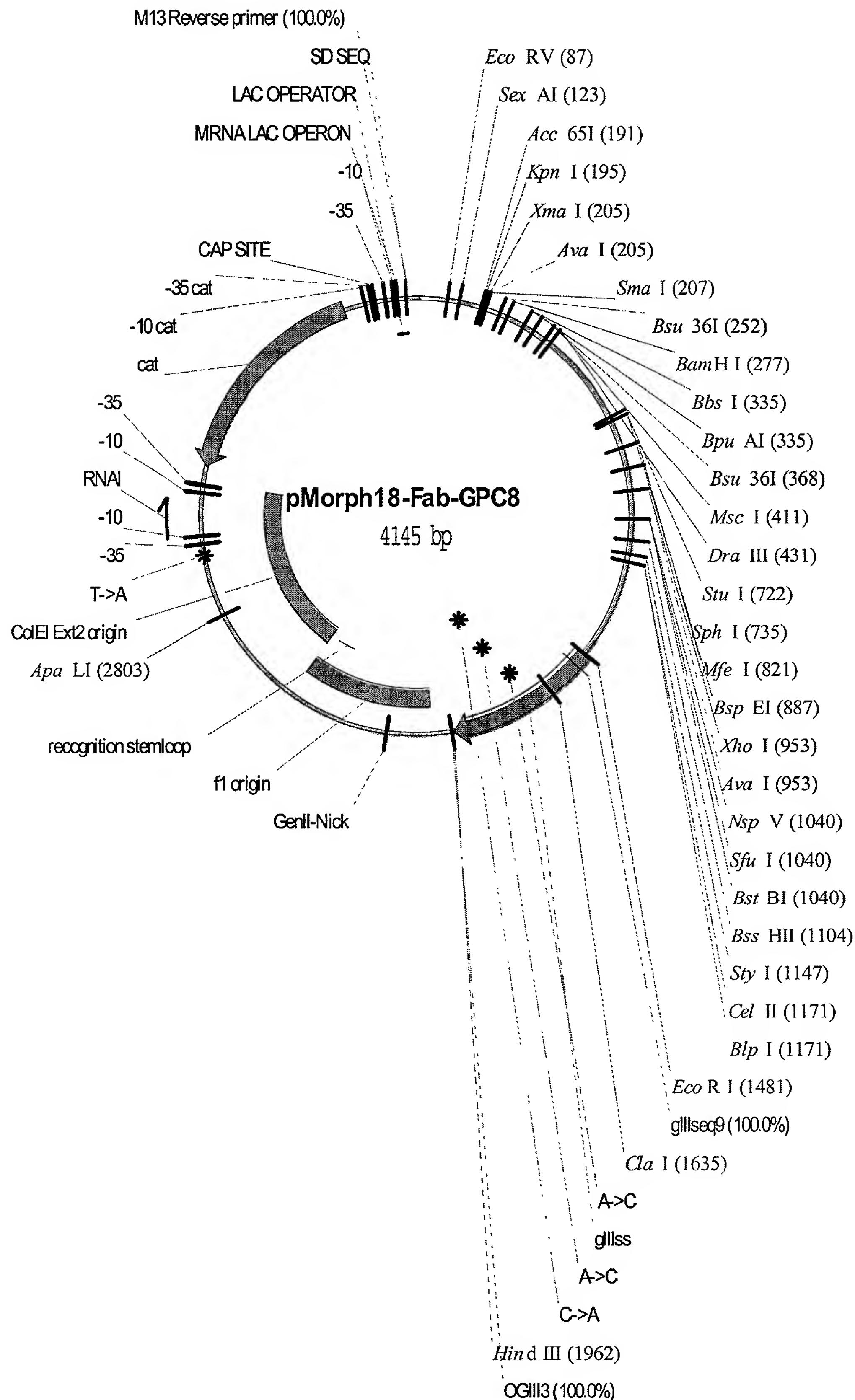


Figure 14 (cont)

1 TCAGATAACG AGGGCAAAAA ATGAAAAAAGA CAGCTATCGC GATTGCAGTG
AGTCTATTGC TCCCGTTTT TACTTTTCT GTCGATAGCG CTAACGTCAC

EcoRV
~~~~~

51 GCACTGGCTG GTTCGCTAC CGTAGCGCAG GCCGATATCG TGCTGACCCA  
CGTGACCGAC CAAAGCGATG GCATCGCGTC CGGCTATAGC ACGACTGGGT

SexAI  
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101 GCCGCCTTCA GTGAGTGGCG CACCAGGTCA GCGTGTGACC ATCTCGTGA
CGCGGAAAGT CACTCACCGC GTGGTCCAGT CGCACACTGG TAGAGCACAT

KpnI
~~~~~

151 GCGGCAGCAG CAGCAACATT GGCAGCAACT ATGTGAGCTG GTACCAGCAG  
CGCCGTCGTC GTCGTTGAA CCGTCGTTGA TACACTCGAC CATGGTCGTC

XmaI  
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SmaI
~~~~~

AvaI

Bsu36I

201 TTGCCCAGGA CGGCGCCGAA ACTGCTGATT TATGATAACA ACCAGCGTCC  
AACGGGCCCT GCCGCGGCTT TGACGACTAA ATACTATTGT TGGTCGCAGG

Bsu36I

BamHI  
~~~~~

251 CTCAGGCGTG CCGGATCGTT TTAGCGGATC CAAAAGCGGC ACCAGCGCGA
GAGTCCGCAC GGCCTAGCAA AATCGCCTAG GTTTCGCCG TGGTCGCGCT

BpuAI
~~~~~

BbsI  
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301 GCCTTGCAG TACGGGCCTG CAAAGCGAAG ACGAAGCGGA TTATTATTGC
CGGAACGCTA ATGCCCGGAC GTTTCGCTTC TGCTTCGCGCT AATAATAACG

Bsu36I

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351 CAGAGCTATG ACATGCCTCA GGCTGTGTT GGCGGCGGCA CGAAGTTAA  
GTCTCGATAC TGTACGGAGT CCGACACAAA CCGCCGCGGT GCTTCAAATT

MscI

DraIII  
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401 CCGTTCTTGG CCAGCCGAAA GCCGCACCGA GTGTGACGCT GTTTCCGCCG
GGCAAGAACCG GGTGGCTTT CGGCGTGGCT CACACTGCGA CAAAGGCAGC

451 AGCAGCGAAG AATTGCAGGC GAACAAAGCG ACCCTGGTGT GCCTGATTAG
TCGTCGCTTC TTAACGTCCG CTTGTTCGC TGGGACCACA CGGACTAATC

501 CGACTTTAT CGGGGAGCCG TGACAGTGGC CTGGAAGGCA GATAGCAGCC

GCTGAAAATA GGCCCTCGGC ACTGTCACCG GACCTTCCGT CTATCGTCGG
551 CCGTCAAGGC GGGAGTGGAG ACCACCACAC CCTCCAAACA AAGCAACAAC
GGCAGTTCCG CCCTCACCTC TGGTGGTGTG GGAGGTTGT TTCGTTGTTG
601 AAGTACGCGG CCAGCAGCTA TCTGAGCCTG ACGCCTGAGC AGTGGAAAGTC
TTCATGCGCC GGTCGTCGAT AGACTCGGAC TGCGGACTCG TCACCTTCAG
651 CCACAGAAGC TACAGCTGCC AGGTACAGCA TGAGGGGAGC ACCGTGGAAA
GGTGTCTTCG ATGTCGACGG TCCAGTGCCT ACTCCCCCTCG TGGCACCTTT

StuI SphI

701 AAACCGTTGC GCCGACTGAG GCCTGATAAG CATGCGTAGG AGAAAATAAA
TTTGGCAACG CGGCTGACTC CGGACTATTG GTACGCATCC TCTTTATTT
751 ATGAAACAAA GCACTATTGC ACTGGCACTC TTACCGTTGC TCTTCACCCC
TACTTTGTTT CGTGATAACG TGACCGTGAG AATGGCAACG AGAAGTGGGG

MfeI

801 TGTTACCAAA GCCCAGGTGC AATTGAAAGA AAGCGGCCCG GCCCTGGTGA
ACAATGGTTT CGGGTCCACG TTAACTTCT TTGCGCCGGGC CGGGACCACT

BspEI

851 AACCGACCCA AACCTGACC CTGACCTGTA CCTTTTCCGG ATTTAGCCTG
TTGGCTGGGT TTGGGACTGG GACTGGACAT GGAAAAGGCC TAAATCGGAC
901 TCCACGTCTG GCGTTGGCGT GGGCTGGATT CGCCAGCCGC CTGGGAAAGC
AGGTGCAGAC CGCAACCGCA CCCGACCTAA GCGGTCGGCG GACCCTTCG

XhoI

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AvaI

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951 CCTCGAGTGG CTGGCTCTGA TTGATTGGGA TGATGATAAG TATTATAGCA
GGAGCTCACC GACCGAGACT AACTAACCT ACTACTATTC ATAATATCGT

BstBI

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SfuI

~~~~~

NspV

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1001 CCAGCCTGAA AACGCGTCTG ACCATTAGCA AAGATACTTC GAAAAATCAG  
GGTCGGACTT TTGCGCAGAC TGGTAATCGT TTCTATGAAG CTTTTTAGTC  
1051 GTGGTGCTGA CTATGACCAA CATGGACCCG GTGGATACGG CCACCTATTA  
CACCACGACT GATACTGGTT GTACCTGGGC CACCTATGCC GGTGGATAAT

BssHII

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1101 TTGCGCGCGT TCTCCTCGTT ATCGTGGTGC TTTGATTAT TGGGGCCAAG
AACGCGCGCA AGAGGAGCAA TAGCACCACG AAAACTAATA ACCCCGGTTC

StyI

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BpuI

## StyI

## ~~~~~ CelII ~~~~~

1151 GCACCCTGGT GACGGTTAGC TCAGCGTCGA CCAAAGGTCC AAGCGTGTTC  
CGTGGGACCA CTGCCAATCG AGTCGCAGCT GGTTCCAGG TTCGCACAAA

1201 CCGCTGGCTC CGAGCAGCAA AAGCACCAGC GGCGGCACGG CTGCCCTGGG  
GGCGACCGAG GCTCGTCGTT TTCGTGGTCG CCGCCGTGCC GACGGGACCC

1251 CTGCCTGGTT AAAGATTATT TCCCGGAACC AGTCACCGTG AGCTGGAACA  
GACGGACCAA TTTCTAATAA AGGGCCTTGG TCAGTGGCAC TCGACCTTGT

1301 GCGGGGCCTGCT GACCAGCGGC GTGCATACCT TTCCGGCGGT GCTGCAAAGC  
CGCCCCGCGA CTGGTCGCCG CACGTATGGA AAGGCCGCCA CGACGTTTCG

1351 AGCGGCCTGT ATAGCCTGAG CAGCGTTGTG ACCGTGCCGA GCAGCAGCTT  
TCGCCGGACA TATCGGACTC GTGCGAACAC TGGCACGGCT CGTCGTCGAA

1401 AGGCACTCAG ACCTATATT GCAACGTGAA CCATAAACCG AGCAACACCA  
TCCGTGAGTC TGGATATAAA CGTTGCACCTT GGTATTGGC TCGTTGTGGT

## EcoRI

1451 AAGTGGATAA AAAAGTGGAA CCGAAAAGCG AATTGGGGGG AGGGAGCGGG  
TTCACCTATT TTTTCACCTT GGCTTTCGC TTAAGCCCCC TCCCTCGCCC

1501 AGCGGTGATT TTGATTATGA AAAGATGGCA AACGCTAATA AGGGGGCTAT  
TCGCCACTAA AACTAATACT TTTCTACCGT TTGCGATTAT TCCCCCGATA  
gIIIseq9 100.0%

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1551 GACCGAAAAT GCCGATGAAA ACGCGCTACA GTCTGACGCT AAAGGCAAAC  
CTGGCTTTA CGGCTACTTT TGCGCGATGT CAGACTGCGA TTTCCGTTT

## ClaI

1601 TTGATTCTGT CGCTACTGAT TACGGTGCTG CTATCGATGG TTTCATTGGT  
AACTAAGACA GCGATGACTA ATGCCACGAC GATAGCTACC AAAGTAACCA

1651 GACGTTCCG GCCTGCTAA TGGTAATGGT GCTACTGGTG ATTTGCTGG  
CTGCAAAGGC CGGAACGATT ACCATTACCA CGATGACCAC TAAAACGACC

1701 CTCTAATTCC CAAATGGCTC AAGTCGGTGA CGGTGATAAT TCACCTTAA  
GAGATTAAGG GTTTACCGAG TTCAGCCACT GCCACTATTA AGTGGAAATT

1751 TGAATAATTT CCGTCAATAT TTACCTTCCC TCCCTCAATC GGTTGAATGT  
ACTTATTAAA GGCAGTTATA AATGGAAGGG AGGGAGTTAG CCAACTTACA

1801 CGCCCTTTG TCTTGCGC TGGTAAACCA TATGAATTCTT CTATTGATTG  
GCGGGAAAAC AGAAACCGCG ACCATTGGT ATACTTAAA GATAACTAAC

1851 TGACAAAATA AACTTATTCC GTGGTGTCTT TGCCTTCTT TTATATGTTG  
ACTGTTTAT TTGAATAAGG CACCACAGAA ACGCAAAGAA AATATAAAC

1901 CCACCTTAT GTATGTATT TCTACGTTG CTAACATACT GCGTAATAAG  
GGTGGAAATA CATACTAAA AGATGCAAAC GATTGTATGA CGCATTATTC

## HindIII

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1951 GAGTCTTGAT AAGCTTGACC TGTGAAGTGA AAAATGGCGC AGATTGTGCG
CTCAGAACTA TTCGAACCTGG ACACCTCACT TTTTACCGCG TCTAACACGC
OGIII3 100.0%

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2001 ACATTTTTT TGTCTGCCGT TTAATGAAAT TGAAACGTT AATATTTGT
TGTAAAAAAA ACAGACGGCA AATTACTTTA ACATTTGCAA TTATAAAACA

2051 TAAAATTAGCG GTTAAATTGT TGTTAAATCA GCTCATTAGT TAACCAATAG
ATTTAAGCG CAATTTAAAA ACAATTTAGT CGAGTAAAAA ATTGGTTATC

2101 GCCGAAATCG GCAAAATCCC TTATAAATCA AAAGAATAGA CCGAGATAGG
CGGCTTAGC CGTTTAGGG AATATTTAGT TTTCTTATCT GGCTCTATCC

2151 GTGAGTGTT GTTCCAGTT GGAACAAAGAG TCCACTATTA AAGAACGTGG
CAACTCACAA CAAGGTCAAA CCTTGTCTC AGGTGATAAT TTCTTGCACC

2201 ACTCCAACGT CAAAGGGCGA AAAACCGTCT ATCAGGGCGA TGGCCCCTA
TGAGGTTGCA GTTTCCCGCT TTTGGCAGA TAGTCCCGCT ACCGGGTGAT

2251 CGAGAACCAT CACCCTAACAT AAGTTTTTG GGGTCGAGGT GCCGTAAAGC
GCTCTGGTA GTGGGATTAG TTCAAAAAAC CCCAGCTCCA CGGCATTCG

2301 ACTAAATCGG AACCCCTAAAG GGAGCCCCCG ATTTAGAGCT TGACGGGGAA
TGATTTAGCC TTGGGATTTC CCTCGGGGGC TAAATCTCGA ACTGCCCTT

2351 AGCCGGCGAA CGTGGCGAGA AAGGAAGGGA AGAAAGCGAA AGGAGCGGGC
TCGGCCGCTT GCACCGCTCT TTCCCTCCCT TCTTCGCTT TCCTCGCCCG

2401 GCTAGGGCGC TGGCAAGTGT AGCGGTACCG CTGCGCGTAA CCACCACACC
CGATCCCGCG ACCGTTACAA TCGCCAGTGC GACGCGCATT GGTGGTGTGG

2451 CGCCGCGCTT AATGCGCCGC TACAGGGCGC GTGCTAGCCA TGTGAGCAA
GCGGCGCGAA TTACGCGGCG ATGTCCCGCG CACGATCGGT ACACTCGTT

2501 AGGCCAGCAA AAGGCCAGGA ACCGTAAAAA GGCCGCGTTG CTGGCGTTTT
TCCGGTCGTT TTCCGGTCCT TGGCATTAGT CCGGCGCAAC GACCGCAAAA

2551 TCCATAGGCT CCGCCCCCT GACGAGCATC ACAAAATCG ACGCTCAAGT
AGGTATCCGA GGCGGGGGGA CTGCTCGTAG TGTTTTAGC TGCGAGTTCA

2601 CAGAGGTGGC GAAACCCGAC AGGACTATAA AGATACCAGG CGTTTCCCCC
GTCTCCACCG CTTGGGCTG TCCTGATATT TCTATGGTCC GCAAAGGGGG

2651 TGGAAGCTCC CTCGTGCGCT CTCCTGTTCC GACCCTGCCG CTTACCGGAT
ACCTTCGAGG GAGCACGCGA GAGGACAAGG CTGGGACGGC GAATGGCCTA

2701 ACCTGTCCGC CTTTCTCCCT TCGGGAAGCG TGGCGCTTTC TCATAGCTCA
TGGACAGGCG GAAAGAGGGA AGCCCTTCGC ACCCGAAAG AGTATCGAGT

2751 CGCTGTAGGT ATCTCAGTTC GGTGTAGGTC GTTCGCTCCA AGCTGGGCTG
GCGACATCCA TAGAGTCAAG CCACATCCAG CAAGCGAGGT TCGACCCGAC

ApaLI

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2801 TGTGCACGAA CCCCCCGTTC AGTCCGACCG CTGCGCCTTA TCCGGTAACT  
ACACGTGCTT GGGGGGCAAG TCAGGCTGGC GACGCGGAAT AGGCCATTGA  
2851 ATCGTCTTGA GTCCAACCCG GTAAGACACG ACTTATGCC ACTGGCAGCA  
TAGCAGAACT CAGGTTGGC CATTCTGTGC TGAATAGCGG TGACCGTCGT  
2901 GCCACTGGTA ACAGGATTAG CAGAGCGAGG TATGTAGGCG GTGCTACAGA  
CGGTGACCAT TGTCTTAATC GTCTCGCTCC ATACATCCGC CACGATGTCT  
2951 GTTCTTGAAG TGGTGGCCTA ACTACGGCTA CACTAGAAGA ACAGTATTG  
CAAGAACCTTC ACCACCGGAT TGATGCCGAT GTGATCTTCT TGTCTAAAC  
3001 GTATCTGCGC TCTGCTGTAG CCAGTTACCT TCGGAAAAAG AGTTGGTAGC  
CATAGACGCG AGACGACATC GGTCAATGGA AGCCTTTTC TCAACCATCG  
3051 TCTTGATCCG GCAAACAAAC CACCGCTGGT AGCGGTGGTT TTTTGTGTTG  
AGAACTAGGC CGTTTGTGTTG GTGGCGACCA TCGCCACCAA AAAAACAAAC  
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GTTCGTCGTC TAATGCGCGT CTTTTTTCC TAGAGTTCTT CTAGGAAACT  
3151 TCTTTCTAC GGGGTCTGAC GCTCAGTGGA ACGAAAACTC ACGTTAAGGG  
AGAAAAGATG CCCCAGACTG CGAGTCACCT TGCTTTGAG TGCAATTCCC  
3201 ATTTGGTCA GATCTAGCAC CAGGCCTTA AGGGCACCAA TAACTGCCCTT  
TAAAACCAGT CTAGATCGTG GTCCGCAAAT TCCCGTGGTT ATTGACGGAA  
3251 AAAAAAATTA CGCCCCGCC TGCCACTCAT CGCAGTACTG TTGTAATTCA  
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AATTCTGTAAG ACGGCTGTAC CTTCGGTAGT GTTGCCGTA CTACTTGGAC  
3351 AATCGCCAGC GGCATCAGCA CCTTGTGCC TTGCGTATAA TATTTGCCCA  
TTAGCGGTGCG CCGTAGTCGT GGAACAGCGG AACGCATATT ATAAACGGGT  
3401 TAGTGAAAAC GGGGGCGAAG AAGTTGTCCA TATTGGCTAC GTTTAAATCA  
ATCACTTTG CCCCCGCTTC TTCAACAGGT ATAACCGATG CAAATTAGT  
3451 AAAACTGGTGA AACTCACCCA GGGATTGGCT GAGACGAAAA ACATATTCTC  
TTTGACCACT TTGAGTGGGT CCCTAACCGA CTCTGCTTT TGTATAAGAG  
3501 AATAAACCCCT TTAGGGAAAT AGGCCAGGTT TTCACCGTAA CACGCCACAT  
TTATTTGGGA AATCCCTTA TCCGGTCCAA AAGTGGCATT GTGCGGTGTA  
3551 CTTGCGAATA TATGTGTAGA AACTGCCGGA AATCGTCGTG GTATTCACTC  
GAACGCTTAT ATACACATCT TTGACGGCCT TTAGCAGCAC CATAAGTGAG  
+1  
3601 CAGAGCGATG AAAACGTTTC AGTTGCTCA TGGAAAACGG TGTAACAAGG  
GTCTCGCTAC TTTTGCAAAG TCAAACGAGT ACCTTTGCC ACATTGTTCC  
3651 GTGAACACTA TCCCATATCA CCAGCTCACC GTCTTCATT GCCATACGGA  
CACTTGTGAT AGGGTATAGT GGTGAGTGG CAGAAAGTAA CGGTATGCCT  
3701 ACTCCGGGTG AGCATTCAAGGCGGCAA GAATGTGAAT AAAGGCCGGA  
TGAGGCCAC TCGTAAGTAG TCCGCCGTT CTTACACTTA TTTCCGGCCT

3751 TAAAACTTGT GCTTATTTT CTTTACGGTC TTTAAAAAGG CCGTAATATC  
      ATTTGAAACA CGAATAAAAAA GAAATGCCAG AAATTTTCC GGCATTATAG  
  
3801 CAGCTGAACG GTCTGGTTAT AGGTACATTG AGCAACTGAC TGAAATGCCT  
      GTCGACTTGC CAGACCAATA TCCATGTAAC TCGTTGACTG ACTTTACGGA  
  
3851 CAAAATGTTTC TTTACGATGC CATTGGGATA TATCAACGGT GGTATATCCA  
      GTTTACAAG AAATGCTACG GTAACCCTAT ATAGTTGCCA CCATATAGGT  
  
3901 GTGATTTTT TCTCCATTTC AGCTCCTTA GCTCCTGAAA ATCTCGATAA  
      CACTAAAAAA AGAGGTAAAAA TCGAAGGAAT CGAGGACTTT TAGAGCTATT  
  
3951 CTCAAAAAAAT ACGCCCGGT A GTGATCTTAT TTCATTATGG TGAAAGTTGG  
      GAGTTTTTA TGCGGGCCAT CACTAGAATA AAGTAATACC ACTTTCAACC  
  
4001 AACCTCACCC GACGTCTAAT GTGAGTTAGC TCACTCATTA GGCACCCAG  
      TTGGAGTGGG CTGCAGATT A CACTCAATCG AGTGAGTAAT CCGTGGGGTC  
  
4051 GCTTACACT TTATGCTTCC GGCTCGTATG TTGTGTGGAA TTGTGAGCGG  
      CGAAATGTGA AATACGAAGG CCGAGCATAAC AACACACCTT AACACTCGCC

M13 Reverse primer 100.0%

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4101 ATAACAAATT CACACAGGAA ACAGCTATGA CCATGATTAC GAATT  
      TATTGTTAAA GTGTGTCCTT TGTGATACT GGTACTAATG CTTAA

## Figure 15

MS-GPC-1 :

VH

QVQLKESGPALVKPTQTLTCTFSGFSLSTSGVGVGWIHQPPGKALEWLALID  
WDDDKYYSTSLKTRLTISKDTSKNQVVLMTNMDPVDTATYYCARQYGHRGFFD  
HWGQGTLTVSS

VL

DIVLTQPPSVSGAPGQRTISCSGSSNIGSNYVSWYQQLPGTAPKLLIYDNNQ  
RPSGVPDFSGSKSGTSASLAITGLQSEDEADYYCQSYDFNESVFGGGTKLTVL  
G

MS-GPC-6

VH

EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYAMSWVRQAPGKGLEWVSAISGS  
GGSTYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARGYGRYSPDLW  
GQGTLTVSS

VL

DIVLTQSPATLSLSPGERATLSCRASQSVSSSYLAWYQQKPGQAPRLLIYGASS  
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RT

MS-GPC-8

VH

QVQLKESGPALVKPTQTLTCTFSGFSLSTSGVGVGWIHQPPGKALEWLALID  
WDDDKYYSTSLKTRLTISKDTSKNQVVLMTNMDPVDTATYYCARSPRYRGAFD  
YWGQGTLTVSS

VL

DIVLTQPPSVSGAPGQRTISCSGSSNIGSNYVSWYQQLPGTAPKLLIYDNNQ  
RPSGVPDFSGSKSGTSASLAITGLQSEDEADYYCQSYDMPQAVFGGGTKLTVL  
G

MS-GPC-10

VH

QVQLKESGPALVKPTQTLTCTFSGFSLSTSGVGVGWIHQPPGKALEWLALID  
WDDDKYYSTSLKTRLTISKDTSKNQVVLMTNMDPVDTATYYCARQLHYRGFFD  
LWGQGTLTVSS

VL

DIVLTQPPSVSGAPGQRTISCSGSSNIGSNYVSWYQQLPGTAPKLLIYDNNQ  
RPSGVPDFSGSKSGTSASLAITGLQSEDEADYYCQSYDLTMGVFGGGTKLTVL  
G

MS-GPC-8-6

VH

QVQLKESGPALVKPTQTLTLTCTFSGFSLSTSGVGVGWIRQPPGKALEWLALID  
WDDDKYYSTSLKTRLTISKDTSKNQVVLMTNMDPVDTATYYCARSPRYRGAFD  
YWQGTLTVSS

VL

DIVLTQPPSVSGAPGQRVTISCSGSSSNIGSNYVSWYQQLPGTAPKLLIYDNNQ  
RPSGVPDFSGSKSGTSASLAITGLQSEDEADYYCQSYDYDHVFGGTKLTVL  
G

MS-GPC-8-10

VH

QVQLKESGPALVKPTQTLTLTCTFSGFSLSTSGVGVGWIRQPPGKALEWLALID  
WDDDKYYSTSLKTRLTISKDTSKNQVVLMTNMDPVDTATYYCARSPRYRGAFD  
YWQGTLTVSS

VL

DIVLTQPPSVSGAPGQRVTISCSGSSSNIGSNYVSWYQQLPGTAPKLLIYDNNQ  
RPSGVPDFSGSKSGTSASLAITGLQSEDEADYYCQSYDLIRHVFGGKLT  
V  
G

MS-GPC-8-17

VH

QVQLKESGPALVKPTQTLTLTCTFSGFSLSTSGVGVGWIRQPPGKALEWLALID  
WDDDKYYSTSLKTRLTISKDTSKNQVVLMTNMDPVDTATYYCARSPRYRGAFD  
YWQGTLTVSS

VL

DIVLTQPPSVSGAPGQRVTISCSGSSSNIGSNYVSWYQQLPGTAPKLLIYDNNQ  
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V  
G

MS-GPC-8-27

VH

QVQLKESGPALVKPTQTLTLTCTFSGFSLSTSGVGVGWIRQPPGKALEWLALID  
WDDDKYYSTSLKTRLTISKDTSKNQVVLMTNMDPVDTATYYCARSPRYRGAFD  
YWQGTLTVSS

VL

DIVLTQPPSVSGAPGQRVTISCSGSSSNIGSNYVSWYQQLPGTAPKLLIYDNNQ  
RPSGVPDFSGSKSGTSASLAITGLQSEDEADYYCQSYDMNVHVFGGKLT  
V  
G

MS-GPC-8-6-13

VH

QVQLKESGPALVKPTQTLTCTFSGFSLSTSGVGVGWIRQPPGKALEWLALID  
WDDDKYYSTSLKTRLTISKDTSKNQVVLMTNMDPVDTATYYCARSPRYRGAFD  
YWQGTLTVSS

VL

DIVLTQPPSVSGAPGQRVTISCSGSESNIGANYVTWYQQLPGTAPKLLIYDNNQ  
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G

MS-GPC-8-10-57

VH

QVQLKESGPALVKPTQTLTCTFSGFSLSTSGVGVGWIRQPPGKALEWLALID  
WDDDKYYSTSLKTRLTISKDTSKNQVVLMTNMDPVDTATYYCARSPRYRGAFD  
YWQGTLTVSS

VL

DIVLTQPPSVSGAPGQRVTISCSGSESNIGNNYVQWYQQLPGTAPKLLIYDNNQ  
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G

MS-GPC-8-27-41

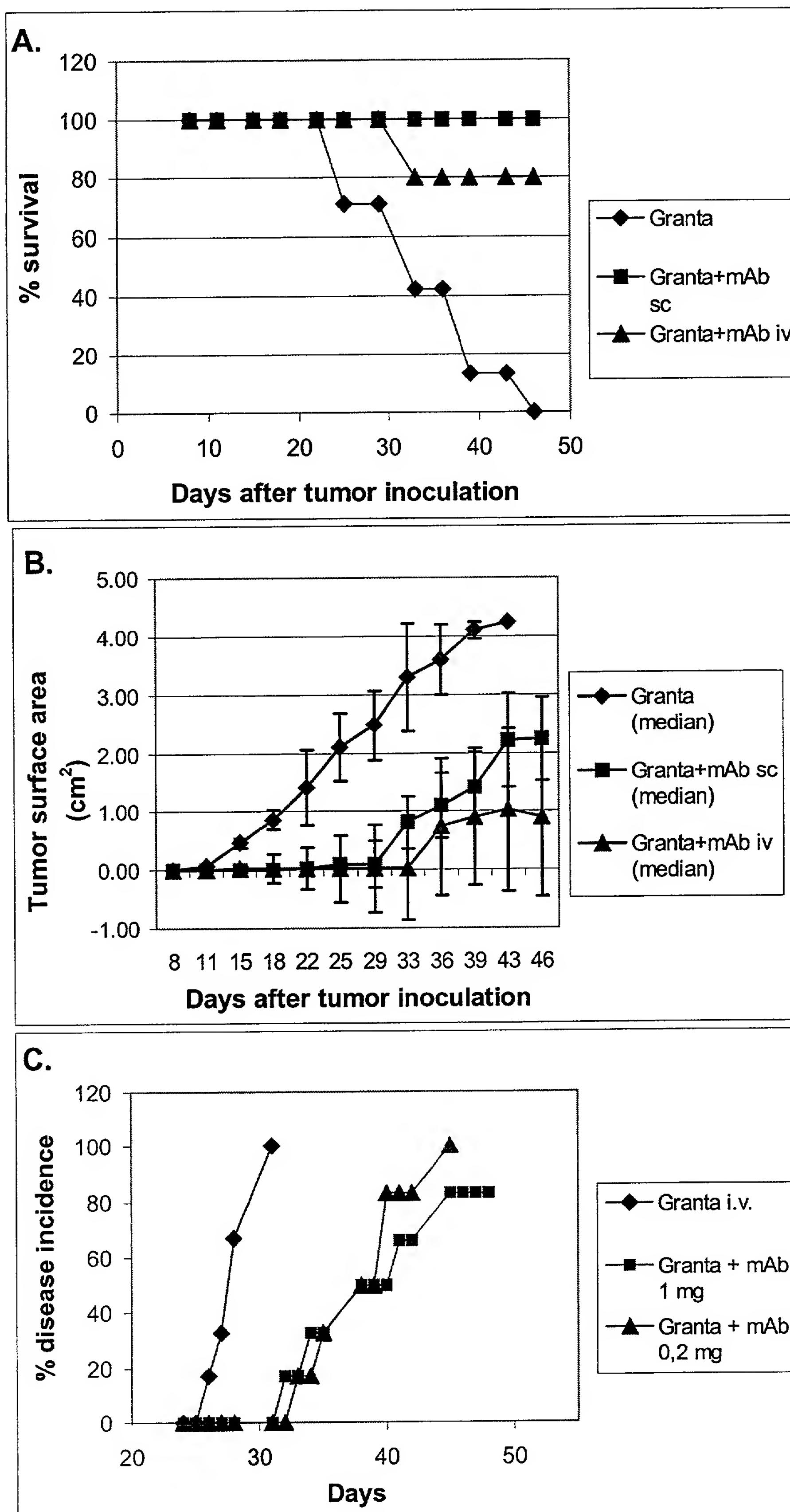
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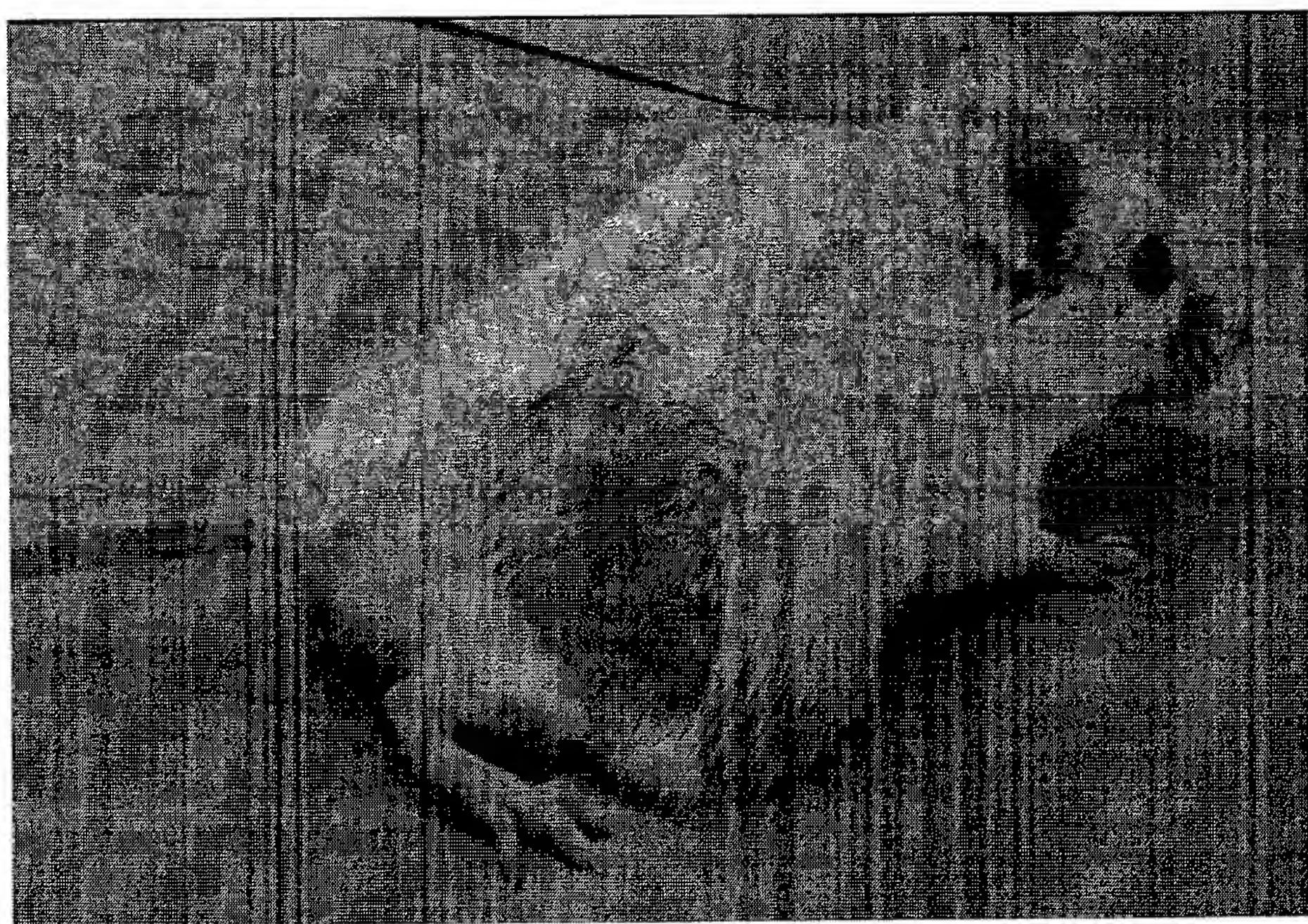
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G

# Figure 16



## Figure 16 (Cont.)

**D**



**Mouse #2, untreated, day 32; tumor area  $4.76 \text{ cm}^2$**

**E**



**Mouse #13, mAb i.v., day 32; tumor area  $0.01 \text{ cm}^2$**